Australian PV Association

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Report for the

Low Emissions Technology and Abatement – Renewables Program

BEST PRACTICE GUIDELINES FOR LOCAL GOVERNMENT APPROVAL OF PHOTOVOLTAIC INSTALLATIONS

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About this report

This report provides a summary of current procedures being followed by local governments around Australia for installation of photovoltaic (PV) systems in urban areas. It also examines relevant Planning and Solar Access regulations which impact on PV.

The information was compiled via discussions with Councils, PV installers, State Government agencies, Solar City managers and others. Internet Surveys were also used and these were publicised via Local Government Associations and other interested organisations.

Guidelines for use by Local Government for Approval of PV Systems have also been developed.

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The Australian PV Association

The objective of the Association is to encourage participation of Australian organisations in PV industry development, policy analysis, standards and accreditation, advocacy and collaborative research and development projects concerning photovoltaic solar electricity.

The APVA provides:

- Up to date information on PV developments around the world (research, product development, policy, marketing strategies) as well as issues arising
- A network of PV industry, government and researchers which undertake local and international PV projects, with associated shared knowledge and understanding
- Australian input to PV guidelines and standards development
- Management of Australian participation in the IEA-PVPS.

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EXECUTIVE SUMMARY

BACKGROUND

Photovoltaics (PV) is rapidly becoming a mainstream technology in many parts of the world and its application in urban areas of Australia is expected to continue to grow in coming years, due to price decreases, market stimulation by governments, building energy ratings and greenhouse gas emission reduction targets.

The need for Local Government involvement in PV deployment is not clear. In many areas, only electricity industry approvals are sought. In others, Development Applications (DAs) through local Councils are required. In the latter case, the PV industry, and hence customers, are routinely faced with delays, application costs, additional insurance and solar access uncertainties when trying to install even small PV systems which meet all Australian standards. For installers, the problems are exacerbated since each Council has a different approach and different requirements concerning the need for DAs, the level of detail required, and the associated cost and timeline, while State Government Solar Access legislation and building insurance requirements also differ. Most Councils have little internal knowledge or procedures in place to deal with PV enquiries and hence decisions can be ad-hoc, while applications for installation can incur long processing times and significant costs.

Hence, despite continued reduction in PV manufacturing costs over past decades, installed PV system costs in Australia remain high. This is due at least in part to non-standard, inconsistent and needlessly costly deployment processes, which require different information and procedures for each PV system, processing costs that range from zero to several thousand dollars and varying requirements for, and interpretation of, State Government regulations. The extra time needed for such individual treatment of installations inevitably must be passed on to customers by the system installers. The potential loss of solar access creates market uncertainty and loss of consumer confidence in all solar technologies.

This report examines current practices with regard to PV approvals by a range of local governments across Australia, relevant State legislation and international best practice. Supplementary material on PV, at an appropriate level for use by Councils, has been developed to facilitate streamlined approval for standard systems and rapid approval for others. The report also examines the status of Solar Access rights in Australia and suggests legislative changes, individual procedures and procedures in the Council approval process which might improve longer term outcomes.

The general methodology for this project was based on a series of interviews with key stakeholders, including Councils in five States, Territory Planning Authorities, Local Government Associations, PV system installers, State and Commonwealth government agencies and Solar City managers to ascertain typical PV approval and installation procedures and costs, as well as issues arising. Supplementary information was obtained from other Councils and installers via a web-based survey. A detailed assessment of relevant legislation was undertaken to ascertain solar access rights, as well

as to review the implications of specific clauses in State and Territory legislation. Discussions were also held with architects, Solar City Consortium members, Commonwealth Government agencies and the Cities for Climate Protection coordinator. A review of international local government approaches to PV was also undertaken, focussing on successful processes and proactive Councils.

SOLAR ACCESS

Despite the fact that the need to establish a satisfactory legal regime for solar access protection was recognised over thirty years ago, the analysis in this report shows that the law on this issue is still unsatisfactory. There is considerable scope for legal reform.

The issues to be considered are as follows:

- Do we wish to facilitate the use of common law methods of protecting solar access, such as easements, restrictive covenants and nuisance?
- If we wish to continue with the current development and planning law control approach to solar access protection, what constitutes best practice in the field?
- Should we adopt any of the different approaches taken in the United States by considering more comprehensive controls?

In relation to the common law methods, while easements and restrictive covenants can never provide a universal system of solar access protection as they are a consensual transaction, it is suggested that solar users should be encouraged to safeguard their right to solar access by entering into an easement or restrictive covenant with their neighbour where this is practicable. In light of the lingering uncertainty as to whether a right of solar access to solar collector panels is recognised at common law, it is suggested that consideration should be given by the State legislatures to the enactment of a new section in existing property statutes clarifying the law by declaring that the right of solar access can exist as a separate easement. Such an enactment was made in Colorado in 1975 and has been adopted since in the majority of the other States of the United States.

In light of the inadequacies of the common law forms of protection of solar access, unless more radical forms of law reform are adopted as in the United States, the planning and development law approach represents the best practice in the field. The planning and development approach to solar access protection represents the established system in this country. It enables local factors to be taken into account in the decision making process and is appropriate for all relevant factors to be considered in the planning process. The main challenge is to ensure that the various development plans include an appropriately worded clause or clauses concerning solar access protection. It is here that the current system is weak since there is no similarity of approach between the local authorities in the drafting of the local planning instruments.

To ensure the most effective form of solar access protection as part of the current State planning and development legislation, it is submitted that each local authority should adopt the relevant clause contained in either the Warringah LEP 2000, reg 68 (para 3.2.10 above) or that contained in the City of Adelaide Development Plan, Principle of Development Control 25 (para 3.3.4 above). These clauses should be modified to ensure that solar access is protected for a minimum of (say) six

hours per day between 9 a.m. and 3 p.m. local time (10 a.m. and 4 p.m. during summer time) on the shortest day of the year (June 21) on north-facing surfaces or the next most appropriate area for a PV system.

To assist in avoiding conflicts, landuse plans can take a lead in promoting good solar access zoning. Well orientated lots enable the future building to be more energy efficient, requiring less artificial heating, cooling and lighting and also have potentially greater roof space correctly orientated for solar water heaters and PV arrays. North-facing slopes improve opportunities for solar access; small lots are best suited to north-facing slopes with gradients of less than 15% (or 1:6). South-facing slopes impose a penalty on solar access; large lots and lowest densities are therefore best suited to south facing slopes.

In addition to the improvements in the current system of planning and development controls, it is submitted that municipalities should be empowered by State legislation to adopt a more comprehensive system of solar access controls, if they so wish. In this regard, it is submitted that the most effective and practicable of all the various forms of solar protection adopted in the United States is that of the hypothetical solar fence, as adopted in the City of Boulder, Colorado, and elsewhere. This involves establishing a system of zoning for solar access purposes and for differentiating between different urban areas in terms of the level of solar access protection provided in each area. While this may appear to be discriminatory, it is essential as it is impossible to achieve the same degree of protection in dense inner-city areas as is achievable in more outlying, less densely populated areas. This form of protection could best be adopted in newly-constructed urban areas, where it would form an important part of urban development considerations, but can also be imposed (albeit less effectively) in established city and suburban areas.

KEY LESSONS FROM INTERNATIONAL EXPERIENCES:

- Proactive leadership from Councils in encouraging and facilitating PV in their areas, including establishment of a designated energy department or officer.
- Knowledge of PV amongst planners, maintained via reliable and impartial information, as well as access to a network of local government and PV expertise.
- Accessibility of planners to ratepayers and pertinent planning guidance on:
    - What circumstances require full Development Approval?
    - What may be considered permitted development?
    - What are the planning fees (if any)?
    - What forms and other information are required in support of the application?
    - How long before the applicant is notified of the planning decision?
- Removal of fees for standard systems using approved equipment and accredited installers, and minimising fees for other installations in order to encourage PV uptake.

RECOMMENDATIONS ON LOCAL GOVERNMENT PROCESSES AND PLANNING

- The key issues raised by Councils regarding approvals for PV were heritage streetscapes, That all standard PV systems (eg. do not have heritage or other unusual impacts) should not be required to go through the Development Application process.
    - In NSW, revert the SEPP (Infrastructure) to the requirements of the SEPP (Exempt and Complying Development Codes) that PV systems in heritage areas or on heritage buildings are exempt or complying as long as they are not visible from any road frontage, and that equivalent requirements be standardised throughout Australia
    - Councils in NSW could also give consideration to preparing an LEP which says that the SEPP provisions for PV (and SWHs) do not apply in their LGA (councils in other states and territories could take equivalent action).
- Councils provide a clear set of definitions regarding such standard installations which do not require Council approvals.
- Councils work together and with Local Government Associations to standardise procedures across States/Territories and Australia.
- That Councils waive both pre-DA and DA fees, which can then be funded through a broad-based environmental levy.
- That Councils incorporate the option of allowing certain designs of PV systems on heritage buildings and in heritage areas, rather than just not allowing them to be visible from the public domain. To avoid this becoming too subjective, in addition to standard requirements such as the system being parallel to the roof and a maximum distance above it, Councils could provide lists and photos of particular PV types and styles which would meet heritage requirements eg. amorphous PV on a corrugated surface to look like a corrugated roof, transparent glass PV systems or solar 'slate tiles'.
- Councils could allow some leeway in their definition of 'public domain'. For example, they could distinguish between a well used street with house frontages and a back lane that is mainly used for garbage bins and access to rear garages. Thus, a PV system could be on a heritage building even if it is visible from a back lane.
- That Councils make available (to the general public and staff) a document that outlines the approval process, as well as the SEPP (Infrastructure), DCP, and any Building Codes requirements. It could also suggest ways that system owners and installers can make things easier for themselves if they are likely to have to submit a DA – such as ways that they can better integrate their system into a heritage building.
- That Councils make available a technical guideline for use by council staff to give them a better understanding of the operational characteristics of PV. Short training sessions could also be instigated.
- Councils provide ratepayers with information on PV, plus lists of local accredited installers and components approved for use in Australia.
- Training and accreditation standards are vital, as is their nationwide recognition. There are only a handful of installers that operate across state borders, but the variation in council and

utility procedures and trade licensing is a barrier to lowering installation costs. The Ministerial Council on Energy (MCE) is working towards guidelines for standard connection agreements for PV systems; this project is aiming for a similar approach to development approval. Similarly, standardised procedures could be followed in all States, with specific requirements reflecting State legislation.

- A national insurance scheme for accredited installers that recognise the obligations in terms of the roof structure to which they attach a PV system. This would provide the incentive to reduce risk through training and accreditation.
- There does appear to be a role for the industry to engage with councils and provide some confidence in the skills and knowledge of accredited installers. Short courses on PV including explanation of the Clean Energy Council (CEC) accreditation procedures may be useful.
- Councils to facilitate bulk purchase programs, taking on board lessons learnt from previous bulk purchase initiatives.
- Industry / Government to produce a photographic guidebook that focuses on the aesthetics of PV installations. This could include examples of different panel types and on different house styles including Heritage buildings.

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INTRODUCTION

The scope of work was as follows:

REVIEW CURRENT STATUS OF KNOWLEDGE AND PROCEDURES FOR PHOTOVOLTAIC (PV) SYSTEM APPROVALS:

- Engage with at least 10 local governments in at least two (but hopefully four) state jurisdictions to conduct surveys, telephone interviews and, where feasible, face-to-face meetings with the relevant local government officers and PV installers.
- Work with both Local Government Associations and PV Installers to ascertain the current level of PV knowledge in Councils, determine the current procedures (development control plans and guidelines) and issues facing deployment of PV, including time and cost involved with development applications and additional insurance.
- Categorise the information collected from surveys, telephone interviews and face-to-face meetings into residential and commercial applications, the type of solar system design and heritage and solar access conditions.
- Review any educational material currently made available to development approval proponents in the Councils surveyed on all relevant aspects of PV technology and solar resources.

REVIEW BEST PRACTICE PLANNING PROCESSES AND SOLAR ACCESS LEGISLATION:

- Identify best practice planning processes and lessons being learnt from wide-scale solar PV deployment and assess the applicability of planning-related activities within the Solar Cities Consortia projects to wider-scale planning authorities.
- Examine Solar Access legislation and its application in practice, including developing case studies of projects resulting in litigation, if any, for information on likely court rulings.
- Review development application processes, to identify positive aspects and areas for recommended modification.

REPORT AND FUTURE RECOMMENDATIONS:

- Finalise the Report, including examples of best practice processes and potential bottlenecks for PV deployments, legal aspects to solar access, development control plans and other planning legislation. The Report will include Guidelines which will facilitate streamlined and consistent local government approaches to PV approvals for use by Local Governments across Australia.
- Provide recommendations for future work, including Local Government professional development programs to explain and promote the use of the Guidelines.

BACKGROUND

Photovoltaics (PV) is rapidly becoming a mainstream technology in many parts of the world and its application in urban areas of Australia is expected to continue to grow in coming years, due to price decreases, market stimulation by governments, building energy ratings and greenhouse gas emission reduction targets.

The need for Local Government involvement in PV deployment is not clear. In many areas, only electricity industry approvals are sought. In others, Development Applications (DAs) through local Councils are required. In the latter case, the PV industry, and hence customers, are routinely faced with delays, application costs, additional insurance and solar access uncertainties when trying to install even small PV systems which meet all Australian standards. For installers, the problems are exacerbated since each Council has a different approach and different requirements concerning the need for DAs, the level of detail required, and the associated cost and timeline, while State Government Solar Access legislation and building insurance requirements also differ.

The deployment of new technologies, especially electricity generators, is not a priority area for Councils, since their main focus is on community service delivery and ensuring construction meets relevant regulations. Nevertheless, some Councils have been proactive in encouraging solar installations and energy efficient house design. Councils are required to deal with development applications, including an increasing number of public enquiries regarding PV and other renewable energy technologies. Most Councils have little internal knowledge or procedures in place to deal with these enquiries and hence decisions can be ad-hoc, while applications for installation can incur long processing times and significant costs.

This project has developed material on PV, at an appropriate level for use by Councils, which facilitates streamlined approval for standard systems and rapid approval for others. It examines the status of Solar Access rights in Australia and suggests procedures in the Council approval process which might improve longer term outcomes. Issues of Solar Access have implications for passive solar buildings, solar water heaters, clothes drying as well as PV and maybe other solar technologies in future. As the rate of solar technology deployment increases, problems will occur more often, unless procedures are put in place now.

Despite continued reduction in PV manufacturing costs over past decades, installed PV system costs in Australia remain high. This is due at least in part to non-standard, inconsistent and needlessly costly deployment processes, which require different information and procedures for each PV system, processing costs that range from zero to several thousand dollars and varying requirements for, and interpretation of, State Government regulations concerning building insurance. The extra time needed for such individual treatment of installations inevitably must be passed on to customers by the system installers. The potential loss of solar access creates market uncertainty and loss of consumer confidence in all solar technologies.

Streamlined procedures will minimise PV system costs, while well defined Solar Access rights will provide certainty to investors that they will be able to receive the benefits of their solar systems for years to come. The project outcomes are also of direct relevance to local, state and federal government programs.

METHODOLOGY

The general methodology for this project was based on a series of interviews with key stakeholders, including Councils, in five States, Territory Planning Authorities, Local Government Associations, PV system installers, State and Commonwealth government agencies and Solar City managers to ascertain typical PV approval and installation procedures and costs, as well as issues arising. Supplementary information was obtained from other Councils and installers via a web-based survey. A detailed assessment of relevant legislation was undertaken to ascertain solar access rights, as well as to review the implications of specific clauses in State and Territory legislation. Discussions were also held with architects, Solar City Consortium members, Commonwealth Government agencies and the Cities for Climate Protection coordinator.

The detailed methodology was as follows:

SURVEY DEVELOPMENT

Interviews were arranged in five States with Councils, Territory Planning Authorities and some PV installers. Councils were chosen on the basis of their proactive role in PV development, their involvement in Solar Cities or reports from PV installers and customers of obstructionist, difficult or expensive processes. So as to standardise information received as much as possible, survey templates were developed by the project team and used as the basis of the interviews. The survey was also placed on the Australian PV Association (APVA) website and promoted through Local Government Associations, the Royal Australian Institute of Architects and other contacts. The Council Survey is provided in Appendix 1.

A parallel set of interviews and surveys of PV installers was undertaken to document their first hand experiences with both proactive and more cautious Councils. The Installer Survey is provided in Appendix 2.

SURVEYS AND INTERVIEWS

The following general process was followed for New South Wales, South Australia, Victoria, the Australian Capital Territory, the Northern Territory and Queensland, although not all aspects were covered for each jurisdiction.

- Discussions with Local Government Associations
- Selection of Councils for interview
- Interviews with Councils
- Discussions with installers, architects and the PV Industry
- Use of web-based surveys for Installers and Councils
- Review of legislation.

A list of the organisations which participated in interviews, as well as those submitting web surveys, is shown inTable 1 with details of the individuals who participated in Appendix 8.

Table 1: List of Organisations Contacted

State or Territory	Local Government	PV Installer	Other
NSW	City of Sydney	Beyond Building	Marsh Cashman Koolloos Architects
	Woollahra	Clear Security	NSW Dept of Planning
	Randwick	LJW Solar	
		Rainbow Power Company	
Victoria	Wyndham City Council	Solarquip	Municipal Association of Victoria
	Maribyrnong City Council	Rezeko	Sustainable Energy Authority of Victoria
	City of Port Phillip		Housing Industry Association
	Moreland Solar City		
	Manningham City Council		
	Towong Shire Council		
ACT	n/a	Armada Solar	ACT Planning and Land Authority
		Solartec Renewables	Electrical Safety Unit, ACT Government
		Green Frog Solar	Philip Leeson Architects – ACT Heritage Advisors
		Solar Powered Solutions	
South Australia	City of Onkaparinga	Solar Shop Australia	TAFE SA
	City of Campbelltown	Personal views – solar installer	SA Department of Planning and Local

			Government
	City of Mitcham	Solaris	
		Solar Wind Systems	
		EcoSouth	
Queensland	Brisbane City Council	Gold Coast Solar Powered Solutions	
Northern Territory	Alice Springs Town Council	Novolta	NT Department of Planning and Infrastructure
		Suntec	Project Building Certifiers
			Alice Solar City
Tasmania	Kingsborough Council		
Australia - general			DEWHA – Solar Cities team
			Royal Australian Institute of Architects
			ICLEI - Cities for Climate Protection (CCP)

WIDER INFORMATION

In addition to the interviews and surveys described above, reviews were undertaken of PV procedures in the Solar Cities and other pro-active local government areas. These provided an indication of methods used to streamline the process, minimise cost and deal consistently with issues arising.

Similarly, a review of international local government approaches to PV was undertaken, focussing again on successful processes and proactive Councils.

The findings from both these reviews provided input to the recommendations of this report.

DEVELOPMENT OF GUIDELINES

A brief set of guidelines suitable for distribution to Councils across Australia was developed. The draft Guidelines were discussed with Local Government Associations and the Councils which participated in this project.

They are intended to be brief, easy to use and cover the key issues. They refer to more detailed information which may be required for non-standard installations.

DEVELOPMENT OF RECOMMENDATIONS

A set of recommendations was developed on the basis of the work undertaken. Their aim is to increase awareness and knowledge of PV amongst Local Government and to standardise and streamline PV installation processes across Australia, thereby minimising timelines and costs.

NEW SOUTH WALES

INTERVIEWS

Interviews were held with staff from the City of Sydney, Woollahra Council and Randwick Council, as well as with Marsh Cashman Koolloos Architects who have had significant problems with installations in heritage areas.

Councils which completed a survey: City of Sydney Council, Woollahra City Council, Pittwater Council

Others contacted were: the NSW Department of Planning and the Royal Australian Institute of Architects, who sent out a description of this project Australia-wide in their State newsletters.

Installers contacted: Beyond Building, Clear Security, LJW Solar, Rainbow Power Company.

OVERALL FINDINGS FOR NSW

The City of Sydney, Woollahra and Randwick Councils are in the process of reviewing their Development Control Plans (DCPs). They all consider themselves in favour of PV – for example, through local promotions, council-funded installations and waiving of fees. However, not all council officers are very familiar with PV's technical characteristics, it does add complexity to the planning process and they all thought that heritage was a major issue.

The majority of installers did not have problems with councils because their systems qualified as either exempt or complying and so did not have to go through a Development Application (DA) process. They expressed some concern that the proposed Guidelines might make things more difficult for them by 'bringing them onto the council's radar', and so create more paperwork. The main problems were identified through architects, and these were all related to heritage issues.

DEVELOPMENT APPLICATION PROCESSES

LOCAL ENVIRONMENTAL PLANS

Local Environmental Plans (LEPs) are prepared by local councils to guide planning decisions for their local government area. Through zoning and development controls, Local Environmental Plans (LEPs) enable councils to supervise the ways in which land is used, including the form and location of new development, and the protection of open space and environmentally sensitive areas.

On 31 March 2006, the NSW Government gazetted the Standard Instrument for preparing new LEPs so that all local plans across NSW will use the same planning language. All councils will use the Standard Instrument to prepare a new principal LEP for their local government area, to be completed by 2011.

As a result, most, if not all, councils in NSW are also rewriting their Development Control Plans (DCPs), which sit underneath the LEP, and provide more detailed guidance for and requirements on development proposals. This provides an opportunity for the DCPs to be updated to reflect recent changes in PV technology and society's level of interest in PV.

NSW STATE ENVIRONMENTAL PLANNING POLICY AND DEVELOPMENT CONTROL PLANS

In NSW, all developments must submit a Development Application (DA) that is assessed against a Development Control Plan (DCP) – unless the development is classified as an Exempt or Complying Development. On the 27th Feb 2009 the NSW Government released the State Environmental Planning Policy (SEPP) (Exempt and Complying Development Codes) 2008 which specifies exempt and complying developments. In that version, PV and solar water heaters (SWHs) were removed and placed in SEPP (Infrastructure) – which includes its own Exempt and Complying categories. The sections of the SEPP (Infrastructure) that are relevant to PV are in Appendix 3. These are more restrictive than in the original SEPP (Exempt and Complying Development Codes) (also in Appendix 3).

The original SEPP (Exempt and Complying Development Codes) essentially stated that, for a PV system on a heritage item or in a heritage conservation area to be exempt or complying, it should not be visible from any road frontage. The current SEPP (Infrastructure) essentially states that PV on a heritage item or in a heritage conservation area will be neither exempt nor complying, regardless of whether it is visible from a road frontage. It also specifies that, to be regarded as exempt or complying, the PV system should not require the removal of trees, block views or otherwise adversely affect any adjacent property, or result in excessive glare or reflection. It also states that, on average over any 5 year period, at least 75 per cent of the electricity generated by the system in a 12 month period must be used in or for the building.

There has been opposition to these new SEPP (Infrastructure) requirements by councils and by the NSW Department of Education and Training regarding the blanket exclusion of any systems on heritage items or in heritage conservation areas from being exempt or complying. The City of Sydney has requested that PV systems not visible from the street frontage be considered as Exempt, even when on a heritage item or in a heritage area. According to the Department of Planning this issue will be considered as part of the 1st anniversary review of the SEPP (Infrastructure), which is to commence shortly. Thus, there may be some changes to this SEPP. Until then, any system that does not meet the SEPP (Infrastructure) requirements is automatically required to go through the DCP process and so submit a DA.

The SEPP (Infrastructure) includes solar access requirements but not for PV, only for habitable rooms and the principal private open space of the adjoining property – see Appendix 3.

The issues potentially created by the requirement to use 75% or more of the electricity generated on site do not appear to have been considered further by Councils. This requirement may, of course, severely limit future PV development if, for instance, buildings become more energy efficient, or PV

systems are installed to charge electric vehicles, to balance local electricity network requirements and so on.

COSTS

The maximum DA fees are currently set by the NSW government and are $110 for developments with a value up to $5,000, and for developments with a value between $5,001 and $49,999, $170 plus $3 for each $1,000 (or part thereof). Councils' costs to assess DAs are generally greater than the revenue received through DA fees. Woollahra currently waives the proportion of the DA application fee applicable to PV on a pro rata basis. Where a PV system is the only subject of a DA, the entire fee is waived. The City of Sydney said they would consider waiving it, while Randwick could not say at this stage. In the Snowy River Shire Council area, based in Jindabyne, a solar water heater (SWH) does not require approval on a non-heritage building, but to install a PV system you need approval, which costs $300.

In addition to the DA, councils make a pre-DA process available. This differs slightly between different councils but essentially provides applicants with advice that is both general but also relevant to particular aspects of their proposal. It is provided to reduce time and costs for both the applicant and council staff. It can range from a simple phone call to a meeting with one or more council officers, to a more formal process involving meetings with up to 5 council officers, a site visit and a written response. The more simple pre-DA's are currently free, while more complicated processes that involve a number of staff generally included a fee. Councils are also open to waiving the pre-DA fees, although they pointed out that the staff time had to be paid from somewhere. In general, the waiving of fees caused problems within councils because the section incurring the cost then had to be reimbursed from some other section of council - which can cause internal opposition to fee waiving.

Randwick Council uses its environmental levy to fund environmental initiatives, and could possibly use it in the future to fund PV DA fee exemptions. Other councils could presumably do likewise.

SOLAR ACCESS

City of Sydney, Woollahra and Randwick Councils all said that solar access was a very difficult issue. Alterations/renovations are often restricted to the rear of the building and so both PV and shading caused by second story additions are concentrated in the same area. Providing solar access guarantees is difficult, in part because the installation of a PV system could then place restrictions on neighbours that are additional to those placed on other buildings in the area. Another problem relates to deciding the degree to which shading can be said to encroach on someone else's solar access rights, and how this should be measured eg. by percentage shading or by percentage drop in electrical output. They are open to suggestions for how solar access requirements could be applied, such as moving the system out of the shaded area, including onto the building causing the shading.

City of Sydney's only solar access requirement in their current DCP (2006) is: to ensure sufficient solar access to the 'landscaped area',[1] the maximum allowable building height established in the LEP may not be able to be achieved.

Neither Woollahra's current DCP Exempt & Complying (2005) nor Randwick's current DCP Exempt & Complying (2005) refer to solar access at all, even regarding habitable spaces etc.

HERITAGE ISSUES

Heritage issues were by far the most significant PV-related concern for City of Sydney, Woollahra and Randwick councils - not just for the councillors but also for residents who opposed PV systems because of visual impact in heritage areas. As stated above, any systems on heritage items or in heritage conservation areas are automatically required to go through the DCP process, and all councils' DCPs are undergoing review. Conditions are more restrictive with heritage items (particular buildings) than with heritage areas or heritage streets. The following summarises each council's current position on PV and heritage issues.

City of Sydney's current DCP (2006) states that PV:

- cannot be on principle roof elevations of heritage items, heritage conservation areas or heritage streetscapes, and
- may be visible to public domain but must be flush to roof and not cover more than 25% (even on non heritage items).

Woollahra's current DCP Exempt & Complying (2005) does not refer to PV at all but for solar water heaters states that:

- even in non-heritage areas, must be behind front setback and not visible from public domain, and must not be more than 300mm above the roof.

Randwick's current DCP Exempt & Complying (2005) states that PV:

- must go through the DA process if on a heritage item,
- must not be readily visible from the street if in a conservation area,
- must not be located on any street elevation of the dwelling /roof unless hidden by the parapet,
- must be located on the side or rear elevation of the dwelling/roof only, behind the building line.

The architects interviewed thought that councils' current position was too black and white and they suggested a more 'aesthetically-based' approach. Both City of Sydney and Woollahra said they would be open to this approach but only to the extent that, in their DCPs, they would include a dot

[1] 'Landscaped area' is that area not occupied by any building, structure, car parking or driveway.

point that PV systems may be considered in heritage areas if significant steps had been taken to blend the system into the heritage character of the building. The obvious problem with this sort of approach is that it is subjective and may come down to one or more individuals' value judgements. However, note that the current SEPP (Infrastructure) already includes subjective requirements ie. that PV does not 'create excessive glare or reflection', and does not 'block views or otherwise adversely affect' any adjacent property.

To reduce the degree of subjectivity, the following examples could be incorporated into PV Guidelines issued to Councils, but not necessarily into the DCP: frameless panels, panels flush with roofline, panels similar or same colour as surrounds, and panels on a surface similar to the existing materials. Councils could go one step further and provide lists and photos of particular PV types and styles which would meet heritage requirements eg. amorphous PV on a corrugated surface to look like a corrugated roof, transparent glass PV systems or solar 'slate tiles' as shown in Figure 1.

Although in some cases it may be better to have as small a surface as possible covered with PV, in others it may be best to have the whole surface covered to minimise differences with the immediate surroundings.

Figure 1: Solar slate roof tile by Solar Century

INFORMATION ON PV CURRENTLY AVAILABLE TO COUNCILS AND/OR PROVIDED TO RATEPAYERS

City of Sydney, Woollahra and Randwick councils all said they would be happy to provide information to the general public as well as to their own staff. The information they currently provide is considered quite basic. They would value a brief document that outlines the approval process, as well as the SEPP (Infrastructure), DCP, and any Building Codes requirements. It could also suggest ways that system owners and installers can make things easier for themselves if they are likely to have to submit a DA. For example, ways that they can better integrate their system into a heritage building through the use of appropriate colours, panels flush or integrated into the roof etc (as above). Ideally it should include photos of real-life examples. All councils would be happy to place such a document on their website and integrate it into existing materials.

They would also value a technical guideline for use by council staff to give them a better understanding of the operational characteristics of PV. Some Councils thought their planning staff had very low awareness and understanding of PV. For example, the differences between crystalline and amorphous PV, how much output is lost with shading or suboptimal orientations, and the impact of temperature and consequent need for an air gap or some other form of ventilation, etc. Note that councils are not allowed to distribute material that supports a particular company or product.

VICTORIA

INTERVIEWS

Meetings were held with the Municipal Association of Victoria, Wyndham City Council, Maribyrnong City Council, City of Port Phillip, Moreland Solar City, as well as with the Royal Australian Institute of Architects. The Municipal Association of Victoria hosted a meeting with members from their Environmentally Sustainable Development (ESD) Advocacy Group and representatives from the above Victorian Local Councils.

Councils which completed a survey: Manningham City Council, City of Port Phillip and Moreland Solar City

Installers contacted: Storm Sustainability, Energy Matters, Going Solar, Rezeko, SolarQuip

Installers which completed a survey: SolarQuip

OVERALL FINDINGS

Port Phillip Council heritage controls mean that it is one of the most likely, if not the most likely municipality in Victoria to refuse an application for solar panels. Around 80% of land area in the Port Phillip region is covered by heritage controls, which equates to 60% of buildings. There is a strong community feeling to maintain the distinct cultural characteristics of the local area. Council implemented four pillars of sustainability which involved triple bottom line assessment and cultural value. This is supported by a strong enforcement team that ensures heritage controls are adhered to.

Until recently, there was limited understanding of PV on buildings. Port Phillip Council have now implemented a number of measures to facilitate fast PV installations, including the fast-tracking of applications and the waiving of planning fees. Useful, first stage, information is available to rate payers interested in pursuing BiPV. A permit application is required if the PV is visible from the street, given the heritage controls. Council is not willing, currently, to recommend a given PV product on behalf of rate payers.

In the Maribyrnong Council area English is a second language for a major proportion of Council residents. This presents a challenge in providing simple, helpful advice in considering PV on residential buildings. A PV fact sheet has been produced and council has been proactive in facilitating bulk purchase arrangements to encourage the best price options for ratepayers through an initial register of interest[2]. Having Council endorse the PV bulk purchase program has noticeably increased the number of installation applications. Heritage considerations are still challenging and

[2] This includes basic information on their website http://www.maribyrnong.vic.gov.au/Page/Page.asp?Page_Id=4081&h=1

the key underpinning driver is to avoid any noticeable changes to the existing building fabric. There are no clear guidelines in making such a determination.

According to the Municipal Association of Victoria, solar access legislation protected daylight access but not directly PV that may be impacted by developments, particularly at the back of properties. Wyndham is a very fast developing urban area, so much so that the environmental issues could be perceived as secondary. Although it is likely that over time PV will be considered more favourably through local government planning processes, in at least one case the landowner of a new development had placed a covenant stipulating no solar system integration on the site. This may be to avoid any chance of delays in council approving a DA. This is particularly concerning given the covenant would be unlikely to be upheld and acts as a major deterrent to implementing environmental initiatives to those less aware of their planning rights. Wyndham is also an area with a large residential population of recent migrants, and, hence, English is often a second language.

The Moreland Solar City project, led by Moreland Energy Foundation, is in an early stage of implementation. The project is due to officially launch in late 2009. Moreland Energy Foundation (MEF) Limited is the not-for-profit lead agent for Moreland Solar City which includes partnership with Moreland City Council and Sustainability Victoria. MEF has not directly involved themselves in bulk purchase arrangements but has helped facilitate information nights and given suppliers opportunities to market their products in a competitive environment. Small pockets of suburbs have nominated a leader to interface on behalf of the group with the PV supplier. This has, in the early stages, proved to be very successful and stimulated others to participate. The Moreland Solar City project also involves providing input to an environmentally sustainable development of Coburg Civic centre, which has a goal of being emissions neutral, and will include 2000 new residential buildings and retail space. Cogeneration is a major aspect of the development but it also includes a raft of renewable options.

PLANNING PROCESSES IN VICTORIA

The Victorian State Government recognises a key planning role at the neighbourhood level; that of managing the interaction between conflicting land uses. Whilst the community's basic needs are required to be met, this should be achieved through appropriate and orderly development practices.

The Victorian planning policy framework includes overarching state government provisions covering all Victorian municipalities, known as the Victorian Planning Provisions (VPPs). These controls are governed by the Planning and Environment Act 1987, and include the State Planning Policy Framework (SPPF), Zones, Overlays, Particular Provisions, General Provisions, Definitions and Incorporated Documents. Clause 15.14 of SPPF Environment section refers to renewable energy, encouraging the appropriate use of daylight and solar energy. The relevant extract is as follows:

> ***54.03 SITE LAYOUT AND BUILDING MASSING 19/01/2006- VC37***
> ***54.03-5 Energy efficiency protection objectives: To achieve and protect energy efficient dwellings.***

To ensure the orientation and layout of development reduce fossil fuel energy use and make appropriate use of daylight and solar energy. Standard A7 specifies Buildings should be:

- *Oriented to make appropriate use of solar energy.*
- *Sited and designed to ensure that the energy efficiency of existing dwellings on adjoining lots is not unreasonably reduced.*
- *Living areas and private open space should be located on the north side of the dwelling, if practicable.*
- *Dwellings should be designed so that solar access to north-facing windows is maximised.*

Decision guidelines:

Before deciding on an application, the responsible authority must consider:

- *The design response.*
- *The size, orientation and slope of the lot.*
- *The existing amount of solar access to abutting properties.*
- *The availability of solar access to north-facing windows on the site.*

While local government has limited control over the content of a number of these elements, there is only one section created wholly by the municipality responsible for the scheme; the Local Planning Policy Framework (LPPF). Any use or development must comply with the provisions outlined in the Planning Scheme, and while there is a depth of complexity to this document, its key role is determining what land use or development can occur, and where. Permit triggers are those provisions in the planning scheme that dictate whether a particular use or development requires a planning permit or not, and can be contained in zones, overlays, particular provisions and general provisions. The current scheme contains provisions in the LPPF, Zones and Particular Provisions that aim to protect the solar access of existing dwellings, however these provisions are intended to protect sunlight to habitable windows, or at best to protect the benefits of solar passive design. As such it is debatable, in their current form, the extent to which they help protect the solar resource of an existing photovoltaics installation.

It seems there is currently a lack of a comprehensive approach to dealing with issues of environmental sustainability in almost all Victorian Planning schemes. There are a number of broad aspirational statements throughout the scheme that relate to this theme. Moreland Council, in particular, has worked hard to adopt positive principles of environmental sustainability wherever possible, notably through Clause 21 'Municipal Strategic Statement' and Clause 22 'Local Policies'. While these broad references may not have the ability to directly affect the uptake of solar applications, they do provide the strategic justification for requirements and provisions that could be included in other parts of the scheme.

The most important reference in support of solar applications is found in a state wide provision included in Moreland planning scheme, at Clause 62 'Uses, buildings, works, subdivisions and

demolition not requiring a permit'. This clause provides that 'domestic services normal to a dwelling' are exempt from all requirements in the scheme, except where specifically noted' (Moreland Planning Scheme, Clause 62 p 2). Included in the definition of 'domestic services normal to a dwelling' is a 'solar energy system' (Moreland Planning Scheme, Clause 72 p 1).

Heritage and neighbourhood character protection are two of the key issues addressed by the planning scheme, particularly since the introduction of *Melbourne 2030* which sets out a strategic direction for Melbourne that underpins all the state-wide provisions of the planning scheme. All local content is required to be consistent with and implement this strategy. Essentially, these provisions aim to protect the existing heritage and neighbourhood character value of established urban areas by ensuring new development does not detract from these values. While these goals are an important and necessary part of planning policy, they also present potential conflicts with the requirements and characteristics of PV installations.

HERITAGE ISSUES

The most significant section relating to heritage protection is the Heritage Overlay (Clause 43.01), which affects large areas of Moreland. Provisions relating to neighbourhood character are outlined in the particular provisions for residential development (Clauses 54 and 55). The major barrier posed to PV installations by the heritage overlay is in its tight restrictions on any use or development that alters the external appearance of a building. A PV installation, however, is exempted from permit requirements in most areas aside from those covered by a heritage overlay. While it is likely that a permit would be granted for a solar energy installation affected by a heritage overlay, if it were not visible from the street or other public land, its physical requirements in terms of access to sunlight may mean that this is not always possible.

Clauses 52, 54 and 55 outline various requirements relating to the design response of a proposed residential development, including those relating to neighbourhood character. They state that the design response must be 'appropriate to the neighbourhood and site' and take into account any neighbourhood character objectives as stated anywhere in the Moreland Planning Scheme. Due to the subjective nature of these provisions it is difficult to determine the potential impact of these requirements on PV installations, although it appears in most cases solar installations would satisfy these provisions, given their relatively low visual impact.

All new buildings and most alterations, extensions and additions to existing buildings in Australia require a building permit. The national regulatory document is the Building Code of Australia (BCA), which sets out the technical performance based provisions relating to building design and construction. In addition to the national BCA, Victoria's building regulations are contained in the Building Act 1993 and Building Regulations 2006. While the BCA contains standardised provisions that are implemented nationwide, states also have the ability to include additional requirements through their own legislation. Both the BCA and Victorian state building regulations continue to fail to move fast enough in adopting appropriate sustainability requirements, and so at present only aspire to eliminate worst practice instead of encouraging and requiring best practice.

A final tier of state planning processes is the Victorian Civil and Administrative Tribunal (VCAT) which provides an opportunity for applicants or opponents to appeal the decision made by the responsible authority (in most cases, the local council) in regard to planning permit applications. VCAT has the ability to affirm, vary or overturn the decision made by the responsible authority, making it a very powerful body. The decisions made by VCAT also set precedent, and so can have an effect on individual cases but also similar cases that may arise in the future.

ACT

INTERVIEWS

Interviews were held with the ACT Planning and Land Authority and the Electrical Safety Unit of the ACT Government.

Installers contacted: Armada Solar, Solartec Renewables, Green Frog Solar, Solar Powered Solutions.

Installers which completed a survey: Armada Solar, Solartec Renewables

OVERALL FINDINGS

From a DA perspective there are very generous exemption criteria for solar energy devices from the Planning and Development Regulation 2008.[3] These exemptions should be read in conjunction with the general exemptions which include heritage criteria. The relevant pages are 106 & 107 (for the specifics for solar devices) and 93-97 for the general exemption criteria. Any proposed device and associated structure would have to meet all relevant exemptions, and for rural blocks this would mean complying with the exemptions in part 1.85 (on pages 137 & 138).

The Safety Officer's role is to inspect installations and provide a certificate of safety compliance. Currently inspections are free of charge but there is discussion to add a charge of up to $180. Most installations are conducted satisfactorily but careful attention is given to checking wiring, circuit breakers and ensuring DC cables are labelled correctly.

Chimneys can be removed from non heritage listed residential buildings without a development application, to increase the potential solar access of the roof and avoid shading, but the work is required to be signed off by a building certifier to ensure the roof structure and thermal performance of the building is not adversely impacted.

Whilst positive about the ACT Planning Authority and their lack of objection to PV on non-heritage buildings, installers can be frustrated by Council requirements. Anecdotal evidence suggested there were concerns from the Council officers of glare from the panels. In Canberra PV is generally exempt from the DA process, however the local planning authority is not well informed regarding PV technology and has an extremely difficult process of inspections, which could dissuade installers. It was suggested that ACTPLA have tried to rewrite the Australian PV Standards with no technical understanding of PV systems and that installers therefore have had a great many issues in interpreting the requirements.

[3] See www.legislation.act.gov.au/sl/2008-2/current/pdf/2008-2.pdf

METERING ISSUES

Of related concern, although not a Council issue, is the installation of electricity meters. With a new PV system there can be a need for replacement with smart meters, such as Email A11 meters that are bi-directional but are able to provide both consumption and generation data. Some distributors charge the customer for the new meter, others provide it as part of their service. Charges for new meters can range between $60 and $400. The other issue which varies from region to region is houses with old three phase wiring and old switch boards. If the utility is not willing to install a digital three phase meter, the occupant may need to pay for over $1000 of electricity rewiring work.

HERITAGE ISSUES

Heritage aspects are considered under the 2004 Heritage ACT, which assesses heritage and tree protection value. Anyone wishing to install PV on a heritage listed place must lodge an informal application for approval with the ACT Heritage Council. There is no application fee.

The current ACT heritage guidelines (2007) do not refer to the installation of photovoltaics. It has been suggested by advisors to the Heritage Council that the guidelines be updated to include PV, given the dramatic increase in the number of installations over the past year. Currently PV systems are treated in a similar manner as solar water heaters and TV satellite dishes and the guidelines state for these items:

> *Alterations and Additions to a Heritage Place - new services such as but not limited to solar hot water heaters, ventilators, antennae, and satellite dishes shall not be visible from the public domain.*

However, unofficially, the ACT Heritage Council discourages installations on roof slopes facing the street but are trying to be as amenable as possible. Applicants wishing to install PV on street facing roof slopes should:

- *Demonstrate that there are no other practical places to install the modules. I.e. the roof slope facing the street is the only section of roof to be north facing.*
- *Outline the number of modules required for the system and arrange them in an un obtrusive manner*
- *Modules should be mounted as flush with the roof as possible.*

There are currently no module guidelines (i.e. frameless modules, preferred heritage modules, etc)

The process allows for some degree of subjectivity and each application is treated on a case by case basis. The experience of an ACT building company, which was involved in placing PV on a heritage building in Manuka, is that there is a lack of understanding of the aesthetic possibilities of PV which has resulted in sub-optimal positioning of PV. It seems it was easier to place a more obtrusive TV antenna on the roof than a well integrated PV system.

SOUTH AUSTRALIA

INTERVIEWS

Interviews were held with the City of Onkaparinga, the City of Campbelltown and the City of Mitcham, as well as with TAFE SA and the South Australian Department of Planning and Local Government.

Installers contacted: Solaris, Solar Wind Systems and Eco South.

Installers which completed a survey: EcoSouth

OVERALL FINDINGS

Despite having the largest number of residential grid-connected rooftop PV systems of all the states and territories[4], South Australia offered up very few instances of 'planning' issues with regards to either residential or commercial-scale PV.

The South Australian Government is introducing a range of reforms to the state's Planning System during 2009. Part of this has been a series of amendments to the *Development Act 1993* and *Development Regulations 2008* to establish the Residential Development Code and increase the number of developments that can be classified as complying development, exempt development or development requiring building consent only. These amendments came into operation on March 1st, 2009 and included explicit reference to residential rooftop PV installations.

The introduction of the planning reforms was aimed at avoiding council-specific requirements for a range of building work – including PV. The new regulations separately consider the planning and structural issues of any given PV installation. The role of councils is now restricted to building rules consent in specific cases and planning consent where there are heritage issues. Aesthetics are only allowed to be a consideration in/on designated heritage areas/buildings. In most cases the only issues for consideration are structural issues. The new regulations aim to deal with the vast majority of installations through either a definition of 'exempt' installations or through a new 'accreditation' process for installers.

Specific references to PV can be found in Schedule 1A of the *Development Regulations 2008* "Development that does not require development plan consent" and Schedule 3 "Acts and activities which are not development" (and therefore considered 'exempt development'). A copy of the relevant parts of the Regulations can be found in Appendix 3.

However, very little communication of the requirements had occurred at the time of writing (April 2009) and no cases could be found of a proponent seeking approval for an installation.

[4] PVRP/SHCP data to April 2009 showed 6385 Grid Connected systems out of a national total of 23,864 (¬26%)

Prior to this, development approval requirements have been ambiguous and, typically, installers have put the onus on the purchaser to investigate and comply with local planning requirements. In reality, very few installations have been considered by the planning system and councils reported very few complaints.

Overall, council officers interviewed considered themselves quite aware and supportive of PV and welcomed the guidance afforded by the new Code. No-one expressed any systemic concerns about PV.

For those installations that do require development consent, there is some concern about how the fees are calculated. The Development Act specifies the fee structure for all councils but a number of fee elements are based on the value of the work – the issue is in the use of the value of the panels and inverter etc. in this valuation, as opposed to the value of the 'installation' component (e.g. framing and labour) – see Costs, page 31 for more detail.

Another key issue is that of accreditation and the recognition of this in the approval process. The new SA regulations will involve an additional training and accreditation module, on top of the standard Australian accreditation requirements, that focuses on the assessment of existing roof structures.

IMPLICATIONS:

As of March 1st, 2009 the changes effectively mean that, except for Heritage and Conservation areas, aesthetics is no longer a valid basis for refusing development approval of a PV installation (or grounds for a valid complaint from others).

Once the modified "accreditation" scheme is up and running, most PV systems will be classed as "not development" and therefore will be exempt from a need to involve local government. However, Building Rules Consent will be required for any system overhanging the roofline or not mounted flush (≤ 100 mm) to the roof. Initial estimates are that this might be around 10% of cases, although this spacing may cause over-heating problems for some installations.

The 100kg weight threshold under which any installation is classed as 'not development' and exempt from the need to pursue Development Approval of any kind, translates to around 1kW for most crystalline panels, although some of the newer higher efficiency panels such as the SunPower or Sanyo HIT get up to around 1.4kW under this weight limit. The amorphous panels such as the Kaneka panels popular in SA are much heavier and exceed the weight threshold at around 500W. Hence, under the new regulations, systems under 100kg are entirely exempt. Above 100kg, weight distributed or not, the installation must either be flat on the roof and installed by someone accredited under the modified accreditation scheme or go through a building rules consent process.

SUMMARY

In summary, the new regulations may help to clarify the approvals process, but the level of understanding and appreciation is currently poor. There is a clear task ahead of effectively communicating the requirements and streamlining the process. The Development regulations are historically impenetrable to the layperson and there is no reason to think that this will be different for PV. Examples or case studies might provide useful guidance.

The process, rightly or wrongly, adds to the list of 'red-tape', fees and charges involved in installing a PV system. The 'applicant' responsibilities need to be clearly spelled out (as this is likely to be the customer, not the installer) and clarification on the application of fees would be useful for customers, councils and installers.

Installers made it quite clear that they did not want councils to second-guess their chosen design – in terms of panel type, orientation, potential shading etc.

Installers also made it clear that the new regulations appeared to doubt their ability to judge when a roof structure was not suitable for a PV installation – and to walk away from a job until it was made suitable. There is certainly no universal agreement for the need for the regulations and, hence, for councils to be involved in most cases.

Installers are keen for a very streamlined process - an online application/notification was suggested.

The SA process has used weight as one of the key attributes to distinguish when a system may require approval. Implementation of this is not clear as few outside the PV industry would know whether or not a weight threshold was being exceeded by a given installation at a given point.

SA DEVELOPMENT APPLICATION PROCESSES

Generally, 'Development Plan Consent' + 'Building Rules Consent' = 'Development Approval'. In the case of PV, installations are considered exempt development if they meet some basic criteria set out in the regulations (Schedule 1A, Section 10, Schedule 3 and Section 15 – Solar photovoltaic panels, refer to Appendix 3):

In terms of 'planning' issues, exemption requires that:

- if the building is in an Historic Conservation Zone/Area — no part of the system, when installed, will be able to be seen by a person standing at ground level in a public street.

- if the place where the designated photovoltaic system is installed is a local heritage place, when installed, it is NOT able to be seen by a person standing at ground level in a public street.

And, in terms of 'building' issues, exemption applies to:

- a photovoltaic system comprising solar photovoltaic panels that have a total weight not exceeding 100 kilograms; or
- a photovoltaic system comprising solar photovoltaic panels that have a total weight exceeding 100 kilograms if—

    (i) the weight load is distributed so that it does not exceed 100 kilograms at any 1 point of attachment to the roof; and

    (ii) the panels (and any associated components) do not overhang any part of the roof; and

    (iii) the panels are fitted parallel to the roof with the underside surface of the panels being not more than 100 millimetres above the surface of the roof; and

    (iv) the panels are installed by a person who holds an accreditation under a scheme recognised by the Minister for the purposes of this paragraph.

This modified accreditation scheme is not yet in place. The scheme is being developed in conjunction with the Clean Energy Council (CEC) installer accreditation scheme with the introduction of a supplementary training module (of approximately half a day) that relates specifically to assessing existing roof structures. This module may be offered or required Australia-wide in future.

The accreditation is not about "certifying" the structural integrity of a roof structure but identifying relevant issues/problems and requesting the building owner to consult an engineer BEFORE a PV installation goes ahead. This would not necessarily prevent a customer 'shopping around' until they found an installer willing to proceed regardless.

INFORMATION REQUESTED

Building Rules Consent will require sufficient information to demonstrate compliance with the Building Code of Australia, including certification of structural elements and attachment hardware.

The requirement for Development Plan consent for PV installations is now restricted to prescribed Heritage Areas and Conservation Zones and will require sufficient information to inform an assessment of the impact of the installation on the character of the building and area.

COSTS

Development fees and forms are standardised by Planning South Australia.[5] Advisory Notice 12a issued on July 1st, 2008 sets the current fees to be used by all councils.

The key issue raised by installers was in relation to the calculation of 'development cost'. It is arguable that, for the purposes of assessing the development, the value of modules and inverters is NOT relevant for inclusion. As can be seen below, there are thresholds at $5000 and $10,000 so treatment of 'costs' is relevant.

General:

- Lodgement Fee – the *base amount* (no assessment against building rules) $48.50 (GST exempt)
- Additional Lodgement Fee (if assessment against Building Rules is required and Development Cost > $5,000): *$55.00* Additional to the *base amount.*

Development Plan Consent (if needed):

- Development Plan Assessment Fee (if the development cost does not exceed $10,000) $30.25
- Development Plan Assessment Fee (if the development cost exceeds $10,000 but does not exceed $100,000) $83.00

Building Rules Consent

- Building Rules Fee (Min Fee) $51.50.

It is recommended that clarity be provided (a determination made) on the appropriate valuation method for PV systems, so that the application of fees is not determined on a council by council, case by case basis.

HERITAGE ISSUES

Under the new SA Development Regulations, heritage issues are only relevant to a PV installation *"if, when installed, it is able to be seen by a person standing at ground level in a public street."* This does allow for some degree of subjectivity in application and complexity in demonstration. However, it is not unreasonable to expect a PV installation to be 'sympathetic' to the character of the building to which it is being installed.

Most of the few examples of protracted and/or disputed 'planning' issues in relation to PV installations in SA (as reported in the interviews and anecdotally) involve heritage issues.

[5] See http://www.planning.sa.gov.au/go/forms-and-fees

INFORMATION ON PV AVAILABLE TO COUNCILS AND/OR PROVIDED TO RATEPAYERS

No examples were provided of independently produced information. Most information available is either State or Commonwealth government brochures or websites.

OTHER

STRATA TITLE

Strata Title, Community Title etc may present unique issues as an additional layer of approval from the body corporate often applies. This not something that can be regulated through local government.

TRAINING

Currently in SA there is only one TAFE that provides accreditation to Solar installers - this is, in addition to courses being supplied by the CEC. However, there appears to be unmet demand for trainers. An observation was made that the majority of electricians presenting themselves to courses have almost no understanding of PV systems, which is not surprising as PV would not have been part of their initial electrical training.

The initial focus in the PV industry was on the electrical skills required. The quality and safety of electrical work is relatively well regulated. The 'on roof' work is the focus of the planning system and this does not necessarily coincide with the core skills of most of the accredited installers (who historically come from electrical backgrounds). To obviate the need for detailed scrutiny of individual installations by councils, the accreditation process must provide as much confidence in the 'on roof' work as it currently does for the electrical work.

Regarding Council knowledge of PV, the comment was made that,

> *Council staff should have some basic training in the principles of PV systems, so that they can make informed decisions on what regulations apply, and whether some other department has over-riding authority. After all, a PV system is actually a power station that feeds electricity into a house and also into the "grid".*

QUEENSLAND

INTERVIEWS

Interviews were held with senior staff at Brisbane City Council. An interview was also held with a representative of the Townsville Solar Cities Consortia – see page 55.

Installers contacted: Gold Coast Solar Powered Solutions

OVERALL FINDINGS

In Queensland, the Integrated Planning Act 1997 is the overarching document that provides the framework for Queensland's planning and development assessment system. However, it provides no specific guidance on PV systems, which thus occurs at the level of the local councils.

HERITAGE AND RESIDENTIAL DESIGN – CHARACTER CODES

In Brisbane City Council area, restrictions to installations of PV systems can occur through the Heritage Code and the Residential Design – Character Code.

PV systems installed either on a heritage place or within a heritage precinct are subject to the Heritage Code, and as a result, are subject to a 'code assessment' - unless it involves such significant alterations that it becomes subject to an 'impact assessment'. Unlike other states, Brisbane City Council has no defined heritage guidelines for assessing PV. It would be assessed on a case by case basis based on Burra Charter principles.[6] In essence, this means that the PV system should be reversible[7] and should not significantly detract from the heritage character. However, it is difficult to judge the effectiveness of this approach because the regulatory system is a reactive one, driven by applications to council or complaints to council, both of which have been very limited to date. For the same reasons, solar access has also not been an issue to date.

PV systems installed in Residential Areas in the Demolition Control Precinct are subject to the Residential Design – Character Code. The aim of this code is to reflect or strengthen pre-1946 housing character. As for the Heritage Code, there are no defined guidelines for assessing PV compliance with this code.

QUEENSLAND'S BUILDING ACT AND REGULATION

Queensland's Building Act and Regulation regulates building work in Queensland. The Queensland Development Code (QDC) is a code called-up by the Regulation. The Queensland Development Code

[6] More information on the Burra Charter can be found at http://www.icomos.org/australia/

[7] It should be able to be removed without significant damage to the heritage structure.

consolidates Queensland-specific building standards into a single document, consisting of mandatory and non-mandatory parts. The code covers Queensland matters outside the scope of, and in addition to, the Building Code of Australia, such as good residential design (siting) of buildings to promote the efficient use of a lot and to provide acceptable amenity to residents.

QDC MP4.1 Sustainable Buildings does not contain provisions regarding PV, but rather provides for the installation of energy efficient fixtures and water conservation methods. However, solar access for properties is somewhat addressed in the QDC MP1.1 and 1.2 which provide the siting requirements for small and large lots respectively.

Unfortunately at this stage, the Codes have limited scope with regard to solar access for PV installations. Provisions ensuring adequate daylight to lots and prevention of overshadowing of lots are included for amenity purposes only, rather than for sustainable housing reasons.

Designing for solar access relies to some degree on good lot orientation when the land is first subdivided. Houses in particular can have their solar access opportunities limited by the need to conform to lot shape and the relationship to the primary frontage. Brisbane City Council's Subdivision Code requires that new lot orientation, size and dimensions must facilitate the siting and design of potential dwellings that: maximise energy efficiency, take advantage of microclimatic benefits, allow adequate on–site solar access, and access to breezes.

Providing for solar access is of particular interest to Brisbane City Council and the Queensland State Government. The State Government have indicated to Brisbane City Council that QDC MP1.1 and 1.2 are currently under review and anticipate that a discussion paper exploring “all sustainability options” (including solar access) will be released within the foreseeable future. Expanded sustainability provisions would then apply in Brisbane and across the rest of Queensland.

The State Government has also provided advice that the *Building Regulation 2006* reduces the regulatory burden for PV installations, deeming them “self assessable development” thereby requiring no building approval for installations.

BRISBANE CITY COUNCIL

Brisbane City Council is currently reviewing their City Plan 2000 and, as part of that process, will be reviewing the compliance processes for PV systems, with a view towards making installation simpler and cheaper. They are very interested in the outcomes of this Best Practice Guidelines development project, especially any general principles, such as ways to simply and streamline the PV installation process. However, because the City Plan 2000 is currently being revised and so are in a state of flux, it would be premature to develop any guidelines specifically for them at this stage. It is likely that other councils in Queensland will learn from City of Brisbane’s approach.

NORTHERN TERRITORY

INTERVIEWS

Interviews were conducted with a range of authorities and stakeholders within the Northern Territory including the Northern Territory Government, Department of Planning and Infrastructure, Building Division and Planning Division, Alice Springs Town Council, Alice Solar City, Project Building Certifiers and installer Suntec.

Given the distances between Alice Springs and Darwin, the majority of the interviews were conducted via telephone.

OVERALL FINDINGS

The Northern Territory has the advantage of having a single consistent planning framework across all the various town council's and regional shires. As a result, while the planning and development rules and guidelines as they currently stand provide little guidance regarding the installation of solar PV systems, the general view presented by departmental officials was that they saw few impediments to the development and implementation of cohesive solar PV building and planning guidelines. As noted, these would have the advantage of being able to be implemented Territory wide.

Notwithstanding the generally positive reception, there remains some concern about the appropriateness of self-certification of array frames, given the varied quality of the housing stock within many parts of the Northern Territory.

DEVELOPMENT APPLICATION PROCESSES

LOCAL ENVIRONMENTAL PLANS

Local environmental plans have generally been regarded as relatively weak with respect to housing or industrial development. Environmental plans are typically only reviewed in the context of water management, and in particular storm water run-off. There has to date been little emphasis on energy efficiency within housing developments, although this has started to change more recently with the adoption of the BCA 2008 as the default standard for housing construction. BCA 2008 has far more significant requirements for energy efficiency and subsequently solar PV and solar hot water.

PLANNING AND DEVELOPMENT APPROVALS

The Northern Territory has a planning and development scheme that stands in contrast to many of the states, in that powers associated with development approvals, planning approvals and building certification are vested entirely within the Northern Territory Government. The effect of this

arrangement is to limit the individual input from the various town and shire councils within the Territory, although it does result in generally consistent implementation of the planning scheme across the Territory.

The Planning scheme within the Territory is administered by the Department of Planning and Infrastructure, which make recommendations to the Development Consent Authority (DCA). Figure 2 shows the general process for development approval.

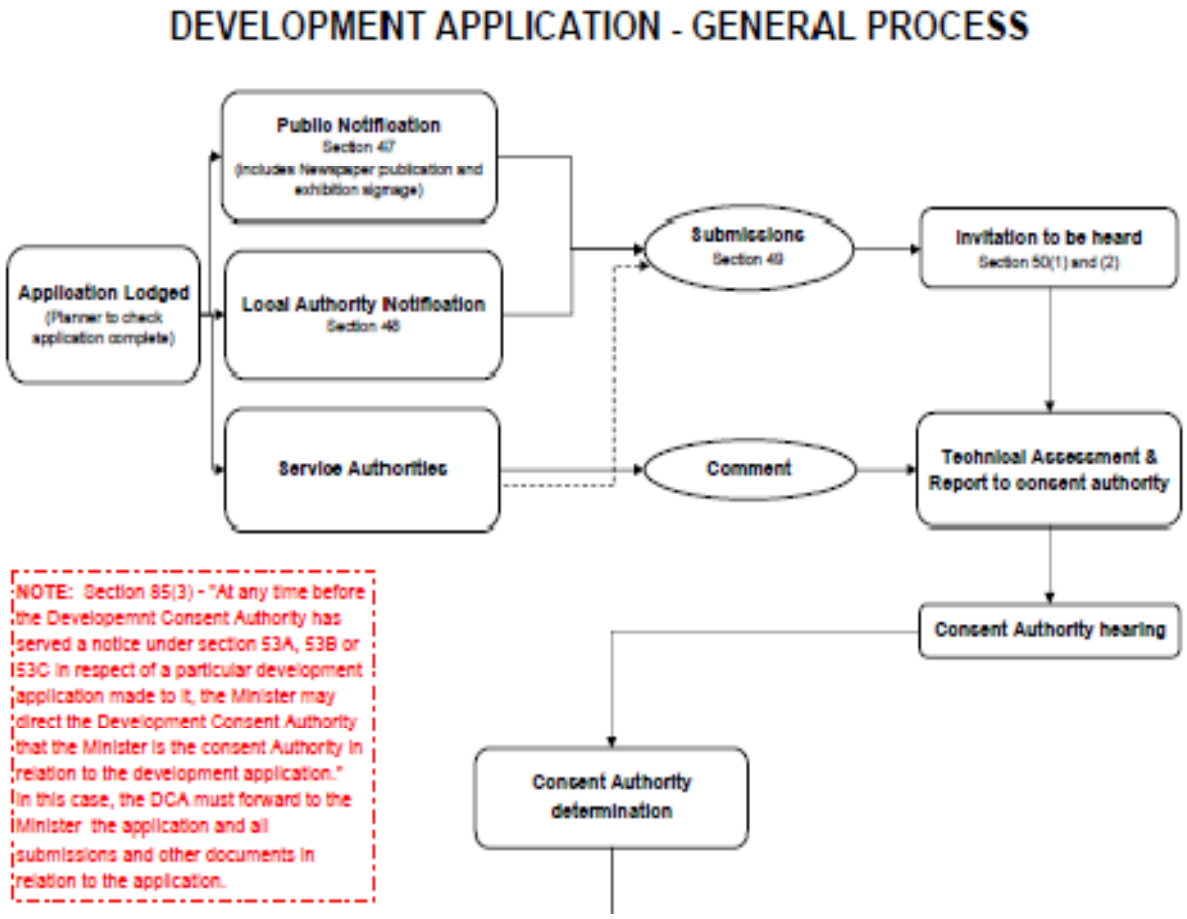

Figure 2: Development Application Process in the Northern Territory

Within the Territory, it has generally been the case that where a proposal is for the replacement of existing portions of the building fabric, or where the changes do not materially change the use or operation of the building, Development Consent is not required, however building approval is still required. The only variations to this have been where the building envelope exceeds the setback limits for building with the proscribed development areas.

As a result, building mounted solar hot water and solar PV systems have not typically ever been assessed by the DCA or the Planning system. It was generally noted, however, that this was perhaps

due to the low penetration of PV systems to date – although it is important to note that the Territory has a very high instance of PV systems overall, however, the majority of the systems are in remote outstations, aboriginal communities and pastoral stations.

There have not been any significant installations of PV within urban areas of the Territory where the installation changes the profile of the building on which it is mounted and as such, it is uncertain how existing development approval processes would respond to such a test. The general indications during the interview process were that the only likely reasons for preventing the change to the building profile would be if there were significant numbers of objections raised by adjacent landowners.

To date the only development approval that has been sought for a solar system, either thermal or PV, has been for a proposed large-scale solar farm south of Alice Springs. The solar installation required an Extraordinary Development Permit as it exceeded the maximum height requirements within the Alice Springs Township of 8.5M. Concerns were initially raised by residents of properties adjacent to the proposed site; however the concerns were allayed by the proponent and the approvals were granted. Unfortunately the project did not proceed due to commercial challenges for the proponent.

It is likely that any large-scale, ground-mounted, PV projects that are proposed in years to come will be required to seek development approval if they are located within the boundaries of gazetted municipalities. A general flowchart of the current approvals process for such systems is shown in Figure 3.

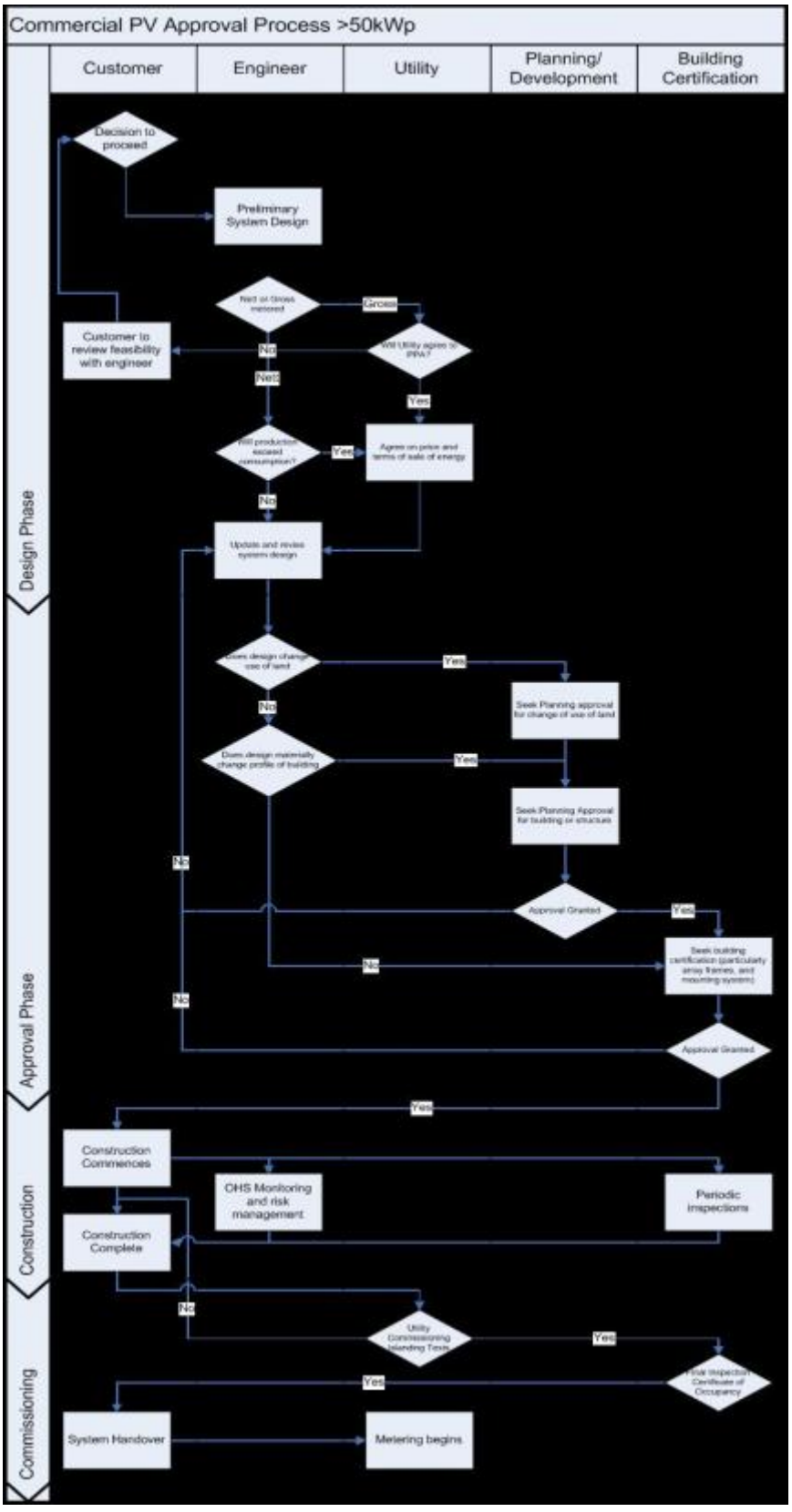

Figure 3: Commercial building PV approval process.

BUILDING APPROVALS

The Territory currently has the highest per capita penetration of Solar Hot Water Systems in Australia and has developed an effective building approval process for such systems. The Building Advisory Branch of DPI works in partnership with the Building Advisory Committee (BAC) – an independent statutory authority tasked with assessing and advising building standards for the Northern Territory Government. The BAC prepares and authorises the release of the Deemed To Comply Manual (DTCM).

The DTCM contains lists of products and components for which no further building certification is required subject to being installed according to the conditions of the certification. To data the DTCM has included such products as pre-fabricated building products, including roofing and wall cladding materials.

For some time Solar Water Heaters (SWH) have been included on the DTCM, with specific requirements around the installation of the SWH in cyclonic regions.

The policy regarding SWH as at 2006 is as below:

General

In the past, it has been generally accepted in the building industry that building approval was not required for the installation of solar hot water heaters (SHWH) providing they are products included in the Deemed to Comply Manual (DTCM) and installation is in accordance with the DTCM. However, with the introduction of status reports on buildings prior to the building being sold, it has brought to light that the SHWH are being classed as unauthorised building work if they don't appear on the building permit plans. No official policy has been previously developed and the Building Advisory Services Branch has not previously considered requirements in relation to the installation of SHWH. This policy is intended to formalise the approval requirements and establish specific guidelines for the installation of these products.

Concession for the Installations of Solar Hot Water Heaters

1. For installations in **Cyclonic areas** (up to 100km from the coast line)-

Building Approval is not required for the installation of solar hot water heaters subject to the following:

The solar hot water heater must be referenced in the Northern Territory "Deemed to Comply Manual" (DTCM) and installation must be in accordance with the appropriate DTCM sheet for that product; and

a) the roof trusses have been modified to support the SHWH in accordance with the truss manufacturers specifications; or

b) A NT registered structural engineer has certified the structural adequacy of the supporting roof system, providing upgrading if required.

NOTE: Any plumbing worked associated with the installation of the solar water heater must be installed and certified by a licensed plumber.

2. For installations in **Non-cyclonic areas** (more than 100km form the coast line including the Adelaide River Township and beyond):

The solar water heater must either by *Type Approved under Regulations 3(2)(a)* by the Director Building Control or be referenced in the Northern Territory "Deemed to Comply Manual" (DTCM) and installation must be in accordance with the appropriate DTCM sheet for that product; and

c) the roof trusses have been modified to support the SHWH in accordance with the truss manufacturers specifications; or

d) A NT registered structural engineer has certified the structural adequacy of the supporting roof system, providing upgrading if required.

NOTE: Any plumbing worked associated with the installation of the solar water heater must be installed and certified by a licensed plumber.

Products not meeting the above requirements will require building approval.

A solar water heater that is to be installed as part of new building works (eg new roof, dwelling or addition) must be included in the Building Permit and Occupancy Permit documentation.

This concession does not provide HBCF type insurance and installation of the Solar Hot Water Heater will not be covered by the Home Building Certification Fund. The BASB does not accept liability should failure occur due to installation.

This policy does not cover the weatherproofing of the roof which is the responsibility of the manufacturer and the installer.

For future property transactions owners should be encouraged to retain all documentation with the regard the installation of the SHWH as evidence that the installation has be carried out in accordance with this exemption

It has been discussed by the Building Services Branch that the policy above could potentially be extended, or a similar policy enacted, for the installation of solar PV. Outside of Alice Solar City, the installation rate of residential PV systems has been quite limited with only 4 grid connected PV systems in the Northern Territory prior to March 2008.

COSTS

The costs for certification and development approvals are generally considered to be quite high relative to other areas of Australia. Although planning approval is generally not required, it can cost up to $600 to apply for a planning approval. Building certification can cost between $500 and $1000, although the lower figure is more often the case.

The costs noted above are based on the gazetted charges for all residential planning and building applications.

As noted previously, were solar PV systems to be included within the DTCM, including array frames, then further certification would not be required, hence reducing the cost of ownership to the householder.

Commercial installations are subject to separate requirements for planning and building approvals. The Crowne Plaza case study illustrates the process.

CASE STUDY: CROWNE PLAZA ALICE SPRINGS

An Alice Solar City Project

Australia's Largest Building Mounted Solar PV System

Set against the MacDonnell Ranges, Crowne Plaza Alice Springs offers guests the opportunity of enjoying the spectacular Red Centre and true Australian outback. The 4 star Crowne Plaza Alice Springs hotel features 236 accommodation rooms, 4 meeting rooms, gymnasium, spa and sauna, swimming pool – heated for those cool desert winters, and two floodlit tennis courts. Dining options include the award winning Hanuman restaurant, Balloons bistro, The Lobby Car and 24 hour room service dining with Body and Soul.

The hotel is owned by Investnorth Pty Ltd and managed by InterContinental Hotels Group (IHG) who operates the hotel under the Crowne Plaza Brand. Both the hotel owners Investnorth and the hotel managers IHG have a shared vision on Corporate Responsibility and Sustainability.

The hotel was originally constructed as in 1982 by Sheraton Hotels – a period of construction in Alice Springs that was not noteworthy for its focus on Energy or water conservation!

As a building that is now more than 25 years old and located in an extremely harsh climate there are many challenges in the ongoing maintenance and operation of the building – particularly with respect to the energy consumption, including Gas and Electricity as well as Water. (It should be noted that all Water for Alice Springs is sourced from sub-artesian bores and as a result reductions in water use result in significant energy reduction as well)

Arial view of the Crowne Plaza 305.4 KWp PV System

As the installation did not materially change the profile of the main roof elevations, a development or planning permit for construction to commence was not required. Due to the age of the building, the installation did require certification of both the array frames and the existing roof structure.

The original structural drawings for the roof were available for review by the engineering team and were assessed by a building certifier as being substantial enough for the addition of up to 20kg/m^2 subject to a site inspection of the roof surfaces to verify that no significant degradation had occurred in the roof structure.

Inspection of the roof structure consisted of removal of roof sheets in a randomly selected sample of the roofs in question. The building certifier was then able to provide certification for the roofs and subsequently provide building approval.

The array frames for the roofs were selected based on the need to be suitable for the existing roof structure and were provided with a "Section 40" engineering certificate for the frames, subject to being installed as per the requirements noted on the certificate.

> NOTE: As the array frame was sourced from outside the Northern Territory, the existing certification for the array was not valid within the Northern Territory. To provide a valid "Section 40" certificate, the certifying engineer must be a registered structural or mechanical engineer on the NPER scheme within the Northern Territory. While not a major impediment, it did require some additional effort for the certifying engineer to gain the registration.

Given the number and angle of the roofs on which the PV panels were to be installed, the health and safety of the employees involved with the installation were of utmost importance to both the owners and managers of the hotel and contractors engaged to complete the installation. As a result, detailed engagement was undertaken with NT WorkSafe inspectors. Subsequently a detailed plan was developed for ensuring worker safety during installation and submitted for approval with NT WorkSafe.

A key portion of the plan was the installation of 78 permanent anchor points to be retrofitted to the various roofs for use during installation and, after commissioning, for maintenance. Although the anchor points installed were of a type specifically designed to be retrofitted through the roofing fabric and connected to the underlying structure, after discussion with NT WorkSafe and Building Advisory Services, it was deemed appropriate to also seek a building permit and certification for their installation.

Finally, one significant part of the project included the development of a "sustainability corner" in one corner of the hotel lobby. See photo below:

Hotel visitors inspecting the Sustainability Corner in the Crowne Plaza

Intriguingly, while the PV system did not require any development or planning approvals, – the sustainability corner was deemed to require a planning approval from the Development Consent Authority, as the construction of the Sustainability Corner was deemed to change the use of the corner of the lobby. The previous use for this area of the lobby was for the display and presentation of tourism brochures and advertising.

SOLAR ACCESS

Given the relative low population, and the generally low density of housing outside the Darwin CBD, there was no concern raised regarding rights to Solar Access. Notwithstanding the general lack of concern for Solar Access rights, there are a number of projects that have been proposed in the NT where solar access may become an issue, although the concern will most likely be as a result of any requirements for vegetation clearance to ensure access, rather than construction of buildings adjacent to the solar PV system.

HERITAGE ISSUES

The vast majority of buildings within the Northern Territory are less than 40 years old – particularly in Darwin where most of the older building stock was destroyed during Cyclone Tracy. However, there do remain some significant heritage buildings in Darwin and Alice Springs. In Alice Springs in particular the CBD includes a designated "Heritage Precinct" where any buildings constructed within the precinct boundary must be constructed in sympathy with the documented heritage characteristics.

To date there has only been one instance where these restrictions within the heritage precinct were applied:

A proposal was put forward by the owner of two properties within the heritage precinct, which had been constructed in 2005, for the installation of two 5kWp solar PV systems.

The buildings had been constructed in sympathy with the surrounding buildings, and were characterised by rendered block work walls and large corrugated iron roofs with lengthy eaves.

Each building had a north facing roof, angled at 23 degrees, with a surface area in excess of 100m^2, however the application for approval to install the PV system was declined on the basis that the solar PV system would detract from the heritage values of the area.

It is interesting to note that one of the buildings for which approval for the PV system was declined already has a large digital display with temperature and time located on the North side of the building.

WESTERN AUSTRALIA

INTERVIEWS

Interviews were held with a City of Fremantle Councillor and with a staff member of the Southern Metropolitan Regional Council, Western Australia.

OVERALL FINDINGS

The City of Fremantle has a greater number of heritage items that most local government areas in Western Australia, and the situation is no different to other states, in that there is currently a focus on striking a balance between heritage values and sustainability. The City of Freemantle does not currently have an explicit policy on PV systems. They are dealt with indirectly through the Local Planning Scheme No 4 (LPS4) under 'external fixtures'. This seemed more restrictive than other states in that, even on non-heritage items, PV systems that can be seen from the public domain require planning approval. As a result of discussions with the City of Freemantle Councillor, a Notice of Motion was approved by Council that requires Council Officers to initiate a amendment to "Schedule 15 - Minor Development Permitted Without Planning Approval" of LPS4 dealing with the propose of removing the requirement for planning approval for solar external hot water heater systems, and solar panels in "all other cases" except when they are "within or on the boundary of a property on the heritage list" or "within or on the boundary of a property on area, but not on a property on the heritage list". In essence this means that PV systems on heritage items will still require planning approval, but others won't.

SOLAR CITIES

CONTACTS

A meeting was held with the Solar Cities team and further comments were subsequently received.

Meetings were also held with representatives of Adelaide Solar City, Alice Springs Solar City and Blacktown Solar City.

In terms of overall progress with many of these implementation issues, Blacktown, Adelaide, Alice Springs and Townsville have been operating and recruiting participants for some time. Central Victoria and Moreland expect to launch later this year (but have been recruiting to some trials, or taking pre-launch registrations of interest).

The Perth Solar City consortium is currently finalising details of their project as part of the negotiation of their funding agreement.

INTERACTION WITH LOCAL GOVERNMENTS

ADELAIDE SOLAR CITY:

Adelaide Solar City has third party arrangements in place for relevant Councils under their funding agreement. All Consortium members, including third party members, form an incorporated joint venture with each member's responsibilities, rights and obligations regulated via contract.

ALICE SOLAR CITY:

Alice Solar City is the only solar city project led by local government - the Alice Springs Town Council. The Council, as lead proponent, has employed a staff of approximately 6 full time dedicated officers to deliver the Alice Solar City project. This includes development of the project offerings, communication, monitoring and reporting, building a database to collect information throughout the life of the project, conducting home energy surveys and liaison with the rest of the consortium. Council also was responsible for negotiating funding and Consortium agreements.

BLACKTOWN SOLAR CITY:

Blacktown City Council is a Consortium member of Blacktown Solar City and has a Consortium agreement with the Consortium leader – BP Solar. Blacktown City Council takes a leading role in the community engagement and promotion activities of the Solar City. For example the Council runs the call centre, provides resources for all Consortium meetings, data working group meetings, steering committee meetings and energy efficiency pack give-aways. Blacktown City Council has also been working with other Consortium members to promote the update of sub–project elements. For example, to promote Integral Energy's Energy Saver Trails to the community an article was written

for the Blacktown Bulletin, Energy Saver Trial brochures were placed on display in Council's Customer Service area and arrangements were made for Integral Energy to visit local childcare Centres to promote the energy saver trials.

CENTRAL VICTORIA SOLAR CITY:

Local government involvement will be a feature of Central Victoria Solar City - as there are 14 local governments involved in the project. Central Victoria Solar City is expected to launch later this year.

MORELAND SOLAR CITY:

Local government involvement at Moreland is through a not for profit organisation called Moreland Energy Foundation (MEF) that includes a consortium of Moreland City Council, the Brotherhood of St Laurence and Sustainability Victoria.

Key components to be officially launched at the end of 2009 include:

- A community-wide campaign which will assist 5000 households, 500 business and 50 community organisations throughout Moreland to reduce carbon emissions and work towards carbon neutrality by 2030;
- Establishment of a community enterprise to deliver energy efficiency services including 1000 energy efficiency audits and retrofits for low income households;
- Redevelopment of Coburg City centre to become an internationally recognised sustainable urban redevelopment, integrating sustainable urban design, innovative technology and distributed generation (part of the Coburg 2020 initiative); and
- A not-for-profit Energy Services Company to coordinate the installation of distributed power generation within the municipality.

TOWNSVILLE SOLAR CITY:

Townsville City Council is a member of the Townsville Solar City Consortium, and provides:

- $1 million in funding and operational support for Citisolar projects (Citisolar aims to engage the community in energy supply and demand issues relevant to the Solar Cities programme and generate behavioural change in demand management through Community-Based Social Marketing)
- Access/use of council land
- Planning facilitation
- Publicity – providing local profile for the Project
- Eco-Biz integrating TCC/EPA partnership supporting Townsville Sustainable Business Network (SBN) and CETD (Sustainability and Innovation) with Solar Cities
- Facilitating incorporation of solar PV and eco-efficiency (Demand Management) options into building and development approvals

- Facilitation of access to the local community networks supporting the Council sustainability programme.

Being within a cyclone area, Townsville council requires a DA and a Building Inspection, which together add about $700 on to the cost of a system (as well as extra time). Nevertheless, Cairns council does not require a DA or a building inspection, even though they are also in a cyclone area. It may be possible to develop Guidelines which allow systems meeting specified requirements to proceed without DAs and inspections.

PROCESSES IN PLACE TO DEAL WITH RESIDENTIAL AND COMMERCIAL PV INSTALLATIONS

ADELAIDE SOLAR CITY:

Councils deliver community engagement and education services through ratepayer newsletters and displays in council buildings. They also support the relevant residential and PV installation packages by facilitating implementation through relevant council development and approval processes under the Residential Development Code and the wider solar city ideas by adopting energy efficiency and other measures as a part of their operations.

Origin Energy's Project Manager for Adelaide Solar City, indicated that there had been no heritage problems because, of the four councils involved, only one (Adelaide City) has heritage areas, and it is focussing on large-scale installations on buildings owned by council. The Sustainability Officer, Adelaide City Council, confirmed this.

Adelaide City Council has recently agreed to waive all development application fees for PV.

BLACKTOWN SOLAR CITY:

All PV installations are managed by BP Solar (Lead Consortium member). A streamlined process has been established to minimise any customer inconvenience. Once potential customers are identified by the call centre, and an application is lodged to the Solar City, processing of financial feasibility, site inspection, and the subsequent installations (through a certified installer program) are managed by BP Solar.

Since the project was launched in June 2007, the Blacktown City Council has agreed to waive DA (Development Application) approval requirements for all PV installations within Blacktown Solar City, as it falls under NSW Planning exemptions. Originally the cost was around $130. This has allowed for steamlining of processes as customers do not have to wait for Council approval before installation. The removal of a chimney in a non-heritage listed building is also classified as minor work and DAs are not typically required, nor a formal neighbourhood notification process. This is important in instances where the chimney may limit the useful solar generation area of the roof.

The changes do have to ensure the insulation characteristics of the roof cavity are not negatively impacted and conflict with BASIXs[8] certification requirements.

ALICE SOLAR CITY

As part of the development of Alice Solar City an incentive scheme was proposed for the installation of approximately 200 residential solar PV systems and a further 20 commercial systems.

While the sourcing of the PV systems was managed through a bulk purchase arrangement by Alice Solar City, the individual installations were managed directly by the householder in partnership with the installer. BP Solar was the chosen supplier, although it is not a consortium member

In order to minimise the complications for the householder associated with the approval and installation of the PV systems, Alice Solar City sought a special exemption for the installations from Building Advisory Services along the line of the solar hot water systems (noted above).

The justification for the approval was based on one supplier providing a defined set of array frames and the roofs on which the systems were being installed complying with the array frame manufacturer's specifications. In addition, the approval was conditional on the installation not materially changing the profile of the building elevations or exceeding the nominated setbacks for the respective zones.

The installer was required to undertake an inspection of each roof prior to installation to verify that the roof complied with the certification requirements as defined by the certifying engineer for the given array frame.

Where the panels were too elevated or raised above the existing roof elevation, with array frames or similar structures, an individual building certification would be required on a case by case basis.

MORELAND SOLAR CITY

The Moreland Solar City project, led by Moreland Energy Foundation, is in an early stage of implementation. The project is due to officially launch in late 2009. Moreland Energy Foundation have has not directly involved themselves in bulk purchase arrangements but have helped facilitate information nights and given suppliers opportunities to market their products in a competitive environment. Small pockets of suburbs have nominated a leader to interface on behalf of the group with the PV supplier. This has, in the early stages, proved to be very successful and stimulated others to participate.

[8] BASIX - the Building Sustainability Index is a NSW Government mechanism to ensure homes are designed to use less potable water and be responsible for fewer greenhouse gas emissions by setting energy and water reduction targets for house and units. BASIX for Alterations and Additions tool assessment is required for renovations above $100,000. See www.basix.nsw.gov.au

HERITAGE ISSUES

ADELAIDE SOLAR CITY:

One heritage issue has arisen so far - relating to an iconic PV installation on a heritage listed building in the CBD. The issue was resolved through normal council development and approval processes where the installation will be installed in a non-prominent location behind the building facade.

CENTRAL VICTORIA SOLAR CITY:

The main issues to date for Central Victoria have been heritage issues in Ballarat for PV and SWH. A way they are looking to get around it for PV is to offer the alternative of rental power for those with heritage/planning issues from the local PV Park.

BLACKTOWN:

As yet there are no known heritage sites used in the solar cities project at Blacktown. From a Council perspective, there are no direct guidelines for evaluating PV but if the PV was flush with the roof and not clearly visible from the streetscape, it would fall under the standard heritage clause exemptions, minor in nature under the Blacktown LEP, division 3 subclause 13-16. There are no costs in this case. Alternations that are deemed major will incur a cost and are on a sliding scale in relation to the total costs of the proposed development application. Blacktown Council has recently submitted a heritage strategy for consideration by the Heritage Branch of the NSW Department of Planning. These are Council recommendations for the adaptive reuse of heritage buildings. The submitted Heritage Strategy includes a recommendation for promoting sustainable development that assists with heritage management. There is currently no specific heritage strategy for PV but it would be a logical approach for NSW to implement recommendations on dealing with PV on heritage protected areas. In general, the removal of chimneys that altered the appearance of the building from the streetscape would require review as to whether they are considered major alterations.

SOLAR ACCESS GUIDELINES FOLLOWED

ADELAIDE SOLAR CITY:

The basic guideline for solar access is to minimise shading - and to consider shading over the whole year. Before installation on site, ASC installers use a solar pathfinder, or a suneye, or similar tool that calculates how the sun tracks across the sky over the entire year, and whether local obstacles will shade the array. In many cases, experienced installers or designers can quickly tell whether or not it will be shaded by more than 5-10% over the year (tall buildings, other equipment on the roof, trees, etc).

When the application for Commonwealth rebates is completed, the estimated output of the system is written down, and DEWHA has the right to refuse funding if it is too low. The exact figure to determine whether it is too low is not clear, however a rough guide could be no more than 20% losses compared to an unshaded system - which is what is implemented in Adelaide Solar City.

The Manager of Building Policy in the Department of Planning and Local Government was of the view that current planning provisions dealt with solar access issues quite well and that previous complaints on solar access grounds have resulted in changes to proposed developments.

ISSUES ARISING FROM LOCAL GOVERNMENT AND STATE LEGISLATION

BLACKTOWN SOLAR CITY:

The NSW statutory requirement for Home Warranty Insurance under section 92 of the Home Building Act 1989 (NSW) (Act) required BP Solar to take out Home Warranty Insurance for the supply and installation of all PV and SWH offers within Blacktown Solar City. The Act required an individual application for a Home Warranty Certificate for each installation being undertaken – resulting in significant amount of administration and an additional cost of $156 per installation.

ADELAIDE SOLAR CITY:

There has been a dispute between the meter provider and the Distributor (ETSA) over metering arrangements for installing Cost Reflective Pricing products. The dispute centred around the inability of a NEM approved contractor to remove the existing network meter, reconnect a new meter and install the necessary safety device under existing ETSA procedures. Discussions were held with the Distributor (ETSA) and the SA Office of the Technical Regulator but proved difficult to resolve. Origin Energy (consortium leader) and its meter provider eventually agreed on a satisfactory approach for implementing the CRP package but not before long delays were experienced rolling out its product pricing meters.

MORELAND SOLAR CITY

Moreland is currently in their pre-launch phase, so the delivery of sub-projects has only partially commenced. For example, Moreland has started to recruit local residents to one of their four initiatives - Zero Carbon Moreland – which focuses on residential scale energy efficiency and sustainability measures. More information about the four initiatives under Moreland Solar City is available on the Moreland Solar City web site (www.morelandsolarcity.org.au).

SOLAR ACCESS

From the project developer (system owner) perspective, a consideration that is likely to become increasingly important, particularly in dense urban environments, is 'Solar Access'. Conventionally that is considered to be the right of a PV or solar thermal system owner to maintain their access to available solar irradiation as per the system design.

A detailed assessment of Solar Access issues in Australia has been undertaken and is contained in Appendix 4. The following provides a summary of findings relevant to Australia. It draws on specific examples from various States, as well as international examples.

BACKGROUND TO SOLAR ACCESS LAW

Despite the fact that the need to establish a satisfactory legal regime for solar access protection was recognised over thirty years ago, the analysis above shows that the law on this issue is still unsatisfactory. There is considerable scope for legal reform.

The issues to be considered are as follows:

- Do we wish to facilitate the use of common law methods of protecting solar access, such as easements, restrictive covenants and nuisance?
- If we wish to continue with the current development and planning law control approach to solar access protection, what constitutes best practice in the field?
- Should we adopt any of the different approaches taken in the United States by considering more comprehensive controls?

COMMON LAW METHODS

In relation to the common law methods, while easements and restrictive covenants can never provide a universal system of solar access protection as they are a consensual transaction, it is suggested that solar users should be encouraged to safeguard their right to solar access by entering into an easement or restrictive covenant with their neighbour where this is practicable. In light of the lingering uncertainty as to whether a right of solar access to solar collector panels is recognised at common law, it is suggested that consideration should be given by the State legislatures to the enactment of a new section in existing property statutes clarifying the law by declaring that the right of solar access can exist as a separate easement. Such an enactment was made in Colorado in 1975[9] and has been adopted since in the majority of the other States of the United States.[10]

[9] Colorado Rev Stat 38.32.5-101 to 102.

[10] See, for example, Alaska Stats, s 34.15.145; California Civil Code, s 801.5; Florida Stat Ann, s. 704.07; Georgia Code Ann, ss 85-1411 to 1414; Idaho Code, s 55-615; Illinois Ann Stat, ch 96.5, s 7303(f); Iowa Code, ss 93.22-25; Minnesota Stat Ann, s 500.30; Montana Rev Codes Ann, ss 70-17-301 to 302; Nebraska Rev Stat, ss 66-901 to 914; New Jersey Stat Ann, ss 46:3-24 to 3.26; Ohio Rev Code, s 5301.63; Virginia Code, ss 55-352-354; Washington Rev Code Ann, ss 64.04.140-170.

There appears to be no need to take the restrictive covenant approach to solar access protection further as this is merely a second, overlapping type of consensual protection of solar access.

In relation to private nuisance, this would appear to be an inappropriate form of solar access protection, relying as it does on individual litigation to secure any solar access safeguards. This can be argued to be an expensive and cumbersome procedure both for the solar user and the State, which assumes the cost of the court structure.

THE PLANNING AND DEVELOPMENT LAW APPROACH TO SOLAR ACCESS PROTECTION

In light of the inadequacies of the common law forms of protection of solar access, unless more radical forms of law reform are adopted as in the United States (see paras 6.6ff below), it is submitted that the planning and development law approach represents the best practice in the field. The planning and development approach to solar access protection represents the established system in this country. It enables local factors to be taken into account in the decision making process and is appropriate for all relevant factors to be considered in the planning process. The main challenge is to ensure that the various development plans include an appropriately worded clause or clauses concerning solar access protection. It is here that the current system is weak since, as shown above, there is no similarity of approach between the local authorities in the drafting of the local planning instruments. There is confusion in many current plans about the use of solar access for energy-generating purposes and for preserving the amenity of sunlight and other ambiguities and gaps in the drafting which collectively render the solar access provisions less effective as a form of protecting investments in solar water heaters and PV systems.

To ensure the most effective form of solar access protection as part of the current State planning and development legislation, it is submitted that each local authority should adopt the relevant clause contained in either the Warringah LEP 2000, reg 68 (para 3.2.10 above) or that contained in the City of Adelaide Development Plan, Principle of Development Control 25 (para 3.3.4 above). These clauses should be modified to ensure that solar access is protected for a minimum of (say) six hours per day between 9 a.m. and 3 p.m. local time (10 a.m. and 4 p.m. during summer time) on the shortest day of the year (June 21) on north-facing surfaces or the next most appropriate area for a PV system. The exact wording to be adopted in each case will need to vary to take account of the context and surrounding wording of the planning instrument.

'SOLAR ACCESS FOR LOTS' PLANNING CONTROLS

To assist in avoiding conflicts, landuse plans can take a lead in promoting good solar access zoning. Well orientated lots enable the future building to be more energy efficient, requiring less artificial heating, cooling and lighting and also have potentially greater roof space correctly orientated for solar water heaters and PV arrays. North-facing slopes improve opportunities for solar access; small lots are best suited to north-facing slopes with gradients of less than 15% (or 1:6). South-facing slopes impose a penalty on solar access; large lots and lowest densities are therefore best suited to south facing slopes.

A Solar Access for Lots (SAL) study in NSW proposed that each lot in a subdivision has both a Flexible Solar Access Zone (FSAZ) and a Minimum Solar Access Zone (MSAZ):

- the FSAZ is the reserved part of the lot that may not be built on, thereby allowing solar access to glazing and private open space.
- the MSAZ is the minimum area of the FSAZ that may not be built upon. The MSAZ can be moved to any place within the FSAZ at development application stage to accommodate a range of house footprints. Once the MSAZ and the dwelling are located at development application stage, the FSAZ is no longer applicable and can be built upon.

A SAL type approach allows lot sizes to be 'fine tuned' to place moderate controls on the dwelling options on a given lot. For example, the dimensions of the solar access zones can be increased where a double storey house is located to the north.

The benefits of ensuring a high proportion of solar orientated blocks can include:

- Easier for builders to achieve the state and national energy efficiency requirements for homes as houses can take advantage of good orientation
- Reduced operating costs and improved internal amenity for home owners with less reliance on heating/cooling appliances and artificial lighting
- Greater outdoor amenity for residents with reduced overshadowing in backyard areas
- Improved opportunity to install solar hot water and photovoltaic systems as homes will be orientated correctly.

However, risks that may be associated with achieving optimal solar orientated lots include:

- Potentially reduced lot yields, particularly in higher density locations;
- Larger lots required on south facing slopes and on the south side of east-west aligned streets;
- Small sites with boundaries not aligned with the preferred orientation.

MORE COMPREHENSIVE CONTROLS AS IN THE UNITED STATES?

In addition to the improvements in the current system of planning and development controls, it is submitted that municipalities should be empowered by State legislation to adopt a more comprehensive system of solar access controls, if they so wish. In this regard, it is submitted that the most effective and practicable of all the various forms of solar protection adopted in the United States, discussed above, is that of the hypothetical solar fence, as adopted in the City of Boulder, Colorado, and elsewhere. This involves establishing a system of zoning for solar access purposes and for differentiating between different urban areas in terms of the level of solar access protection provided in each area. While this may appear to be discriminatory, it is essential as it is impossible to achieve the same degree of protection in dense inner-city areas as is achievable in more outlying, less densely populated areas. This form of protection could best be adopted in newly constructed urban areas, where it would form an important part of urban development considerations, but can also be imposed (albeit less effectively) in established city and suburban areas.

As explained earlier, the system of hypothetical fences works less effectively in hilly areas than flat areas due to the effect of slopes on shadow lengths. It would also be difficult to impose the system in heavily treed localities (such as the Dandenong Ranges or the Adelaide Hills), where there are council policies in favour of retaining the amenity of the treed environment. It is for this reason that each municipality must be given the ultimate discretion as to whether to adopt such a system of solar access protection. However, in favourable terrain the system appears to represent the best legal approach to balancing the rights of neighbours to develop their land and the rights of solar user to solar access protection.

INTERNATIONAL BEST PRACTICE

This section summarises the relevant legislation and procedures in the United Kingdom, the United States and mainland Europe. It includes the national context where that has a significant impact on councils or PV systems in general.

UNITED KINGDOM

The enactment of three key pieces of legislation in late 2008 sets the current context for local planning and renewable energy projects in the UK. The relevant legislation is:

- The Climate Change Act 2008
- The Energy Act 2008
- The Planning Act

The Climate Change Act and the Energy Act are summarised in Appendix 5. The Planning Act 2008 introduces reforms to the town and country planning system as well as the introduction of a Community Infrastructure Levy alongside a new system for nationally significant infrastructure planning.

As regards the town and country planning system, the Act includes placing a duty on councils to take action on climate change in their development plans; and, amongst other aspects to have regard to the desirability of achieving good design and streamlining development control procedures.

The focus on 'good design' covers a number of broad aspects, amongst which is the encouragement of 'more sustainable approaches to transport, energy, water and waste management in response to climate change concerns'.

2004 PLANNING POLICY STATEMENT

The overarching framework for local (and regional) government planning for renewable energy in the UK was set out in the 2004 Planning Policy Statement, PPS22. The policies set out in the PPS need to be taken into account by local planning authorities in the preparation of local development documents. They may also be material to decisions on individual planning applications. At the same time, national policies set out in other planning policy statements / guidelines may also be relevant to consideration of planning for renewable energy.

In particular, the key principles of PPS22 include:

- *…local development documents should contain policies designed to promote and encourage, rather than restrict, the development of renewable energy resources.*
- *At the local level, planning authorities should set out the criteria that will be applied in assessing applications for planning permission for renewable energy projects.*

The second point effectively assigns planning decisions generally to planners at the local level, but the PPS stresses that decisions as to permission should be made in light of the broader environmental and economic benefits of renewable energy projects and any measures to mitigate possible environmental or social impacts. There is also an acknowledgement that small-scale projects have a valuable contribution to overall outputs of renewable energy and to meeting energy needs both locally and nationally.

As regards small-scale developments, the PPS proposes that:

- *Local planning authorities and developers should consider the opportunity for incorporating renewable energy projects in all new developments. Small scale renewable energy schemes utilising technologies such as solar panels, Biomass heating, small scale wind turbines, photovoltaic cells and combined heat and power schemes can be incorporated both into new developments and some existing buildings. Local planning authorities should specifically encourage such schemes through positively expressed policies in local development documents.*

This clause reflected the innovative concept introduced by the London Borough of Merton in 2003; the Council required new buildings over a certain size (originally commercial developments >1,000m^2) to reduce their carbon emissions by 10% through the use of on-site renewables. One practical finding of the implementation of what has become known as the 'Merton Rule' is that the strength and clarity of local government leadership, coupled with the provision of accessible information and supporting resources or tools are fundamental factors in the ease or difficulty facing solar installers and solar system owners. More information on the Merton Rule is given in Appendix 6.

PERMITTED DEVELOPMENT RIGHTS

For domestic installations of PV (and certain other RETs), the necessity to obtain planning permission was removed in England and Wales, effective 6th April 2008 via *Changes to Permitted Development Rights for Householder Microgeneration*. This is on the proviso that the installation does not have an impact on others, and that the installation is not on a Listed (heritage) Building, or in a conservation area. A similar amendment was passed for Scotland effective 12th March 2009.

This measure was introduced to address what was identified by UK government as a potential barrier to householders installing renewable technologies, i.e. the time and expense of getting planning permission. Prior to the introduction of the measure, a full planning application would typically have cost £125.00 (275 AUD), on top of which the applicant would have needed to have relevant plans prepared.

The amendment allows for the installation of solar photovoltaics, (as well as solar thermal, ground and water source heat pumps, biomass heating and combined heat and power systems) on or within the curtilage[11] of the dwelling house.

Size limitations have been set to reduce impact on neighbours.

- Solar panels attached to the building must not protrude more than 200 millimetres from the roof slope
- Free-standing panels must not exceed four metres above ground level and must be more than five metres from the boundary.

USA

PERMITTING

The situation regarding the challenges faced by many would-be solar PV (and small-scale wind energy) users in the USA is described in a recent report by the Network for New Energy Choices (NNEC), 'Taking the Red Tape out of Green Power'. The report, endorsed by, amongst others, ICLEI-Local Governments for Sustainability (USA), highlights three key ways in which the broad development application (permitting) process creates obstacles for small-scale PV installations:

- Complexity of Permitting Processes
- Inconsistency of Permitting Processes across Jurisdictions
- High Permit Fees

Not all of these are necessarily the sole domain of local government. The 'permitting' process normally also involves the local utility (DNSP equivalent for interconnection to the electricity network). However, obtaining the electrical permit from the local utility is generally regarded as more straightforward than design review, structural or other building planning processes.

The building permits encompass structural (dead-loading) as well as wind-loading assessments. Where there is a specific requirement to undertake the latter, these can be the most complex and onerous component of the project-permit process.

Compounding the challenges of meeting what are often onerous and overly complicated documentation and evidence requirements, the NNEC report also noted the views of several interviewees that the relative inexperience of officials reviewing the information and influencing the approvals process is 'among the biggest obstacles to PV installation.' Given, particularly at the domestic scale, systems are generally quite standardised and electrical components particularly are governed by national or international product standards, there is considerable scope to streamline

[11] The enclosed area of land around a dwelling.

the review process. Appraisal times - and with them permit fees – can in many jurisdictions be greatly reduced, but this requires an investment in training by the relevant authority.

Up to a point, the cost of obtaining any required permits was seen as less of a deterrent to installation than the complexity and length of time to secure the approvals. At the same time, it was noted that the time required to assess or inspect typical household systems is broadly similar irrespective of the scale of the installation. As such, the report proposes that where fees are charged for such services, they should be the same irrespective of the system capacity or value of the project (i.e. a flat fee charge structure).

The recommendations most relevant to this report are given in Appendix 7. They can be summarised as follows:

- Standardise approval processes and requirements
- Do not restrict PV systems on aesthetic grounds
- Provide technical training to staff of relevant authorities
- Adopt flat fees where inspection times are the same irrespective of the system capacity or value of the project
- Adopt 'solar rights' legislation

CASE STUDY: SAN DIEGO COUNTY[12]

NECC's findings are broadly mirrored by those of UCAN, a not for profit, public interest utility watchdog in San Diego USA.

UCAN's review of the policies of 17 cities throughout San Diego and the County of San Diego shows a wide discrepancy in the cost of permitting fees and requirements to install photovoltaic (PV) solar panel systems. Permit fees varied from a minimal $22.50 to over $500, with an additional $1,000 Design Review application fee in Del Mar--more than a twenty-fold difference. The variation in type of permits and charges required to install solar panel systems ranged from city to city. Four cities assessed an issuance charge; 12 required plot plans, four required roof & structural plans or a building permit, and six cities had no set requirements for permitting. In fact, no two permitting departments were alike in terms of procedure, costs or required information for installing PV systems.

The huge variation in costs and requirements from city to city was further compounded by a lack of foreknowledge on the part of installers and customers of documents required to successfully fulfil solar system and building inspections and by the limited number of qualified solar permitting inspectors.

[12] Utility Consumers' Action Network, Solar Energy Permitting Fees in the San Diego Region: A Comparative Study with Recommendations.

As per NECC, UCAN also advocates streamlining and standardisation of the permitting process across the County, alongside an appropriate cost for the service with fees and permit processes posted on all municipality web sites. A partnership approach involving solar contractors, installers, regulatory agencies, manufacturers, city and state officials and building and permitting departments is seen as the best means of achieving this objective.

One important recommendation set forward by UCAN is to introduce an experience-based fast-track process for permitting, for example by requiring an additional licensing or workshop procedure to register contractors' competencies or through scrutiny of a contractor's first installation. In Australia this function is already established via the CEC Installer Accreditation.

SOLAR ACCESS

A detailed assessment of different approaches taken to solar access law in the USA is given in Appendix 6. Given the range and complexity of different approaches taken in different states, the Solar America Board for Codes and Standards has recently completed a comprehensive review of Solar Access Law as it exists in the USA [13] and has developed a number of model statutes for use by state and local governments to encourage the use of solar energy.

The Report investigates two distinct Solar Access issues:

- Solar Easements – the ability of one property to continue to receive sunlight across property lines without obstruction from another's property (e.g., buildings, foliage, or other impediments).
- Solar rights - the ability to install solar energy systems on residential and commercial property that is subject to private restrictions (e.g. covenants, conditions, restrictions, bylaws, condominium declarations, and local government ordinances and building codes).

The issue is particularly relevant to the USA since it does not recognise a common law right to sunlight. This was determined in the State of Florida, effectively rejecting a Statute enjoyed in the UK, known as 'Ancient Lights' doctrine. That doctrine had created a lawful access to and use of light.

The Solar ABCs report notes that local governments do have the ability to adopt solar-access policies within the framework of the local comprehensive and land use plans. However, a policy statement can establish the legitimacy of solar-access. Site developers can also provide for reasonable access, which can be underpinned by solar easements which would place a restriction on intrusions by neighbouring lots. Generally, easements are voluntary (i.e. cannot be imposed) and must be recorded in writing with precise locational details as well as any compensation that may be due to

[13] Solar America Board for Codes and Standards, A Comprehensive Review of Solar Access Law in the United States: Suggested Standards for a Model Statute and Ordinance, Colleen McCann Kettles, Florida Solar Energy Research and Education Foundation, October 2008 (www.solarabcs.org/solaraccess)

either the grantor or the beneficiary. One approach that has been used by a state allows for solar system registration with the local governing body, which the report notes is an indirect imposition of a solar easement.

As regards solar rights, statutes may be required to prohibit the express prohibition of solar installations by a governing body (such as a condominium or homeowner association).

Among the recommendations, the report proposes that:

- At the local level, the focus should be on implementation and enforcement of state law, requirement that site-plan review and approval include an element to address the current and future use of solar energy (such as solar easements, landscaping, building height restriction, and orientation).
- The key to the usefulness of a solar access law is enforcement. It is imperative that a specific entity be charged with oversight of the statute. These responsibilities must include responding to consumer and community association inquiries, conflict resolution, and the authority to impose penalties for violation of the statute.

MAINLAND EUROPE

Summaries of the **planning process** in five European Countries and the implications for PV planning at the urban-scale were analysed in 'Urban Planning component of the European Union 'PV UP-SCALE' project (Photovoltaic in Urban Policies - Strategic and Comprehensive Approach for Long-term Expansion)[14]. The project's intent is to bring the economics, bottlenecks (e.g. grid issues), and general 'do and don'ts' for PV-urban planning to the attention of stakeholders in the urban planning process (town planners, architects, utilities, project developers, etc.).

The project included an extensive review of urban areas where the installation of significant amounts of PV has been completed or planned, the objective being to identify common success factors and potential problems.

The process of implementing renewables, including photovoltaics, in urban areas starts with national and regional policy formation and strategies; these set the context in which urban planners create plans for specific urban areas and developments. Plans are then implemented by developers working with builders and architects to construct buildings that meet the needs of the eventual occupiers and residents.

In the majority of cities identified as having installed significant amounts of renewable energy over the last 10 years, the local municipal government has played a key role in stimulating projects. Key factors identified as being common to cities where large amounts of PV have been installed include:

- A strong local political commitment to the environment and sustainability

[14] PV UP-SCALE, (EU contract EIE/05/171/SI2.420208). www.pvupscale.org

- The presence of municipal departments or offices dedicated to the environment, sustainability or renewable energy
- Obligations that some or all buildings include renewable energy
- Information provision about the possibilities of renewables
- Challenging development sites which seem to have inspired some very ambitious renewable energy projects.

PV is installed within a complex framework of regulations, funding arrangements and planning policies. The framework not only varies between countries but also between provinces and even municipalities. In general the framework is designed to promote the use of renewable energy, including photovoltaics, and to reduce carbon emissions. However, with national, regional and municipal governments involved and different departments responsible for different parts of the framework, the general result can be somewhat fragmented with a general trend towards the promotion of renewables, but with some policies and regulations working against the general trend and having negative impacts on the implementation of PV.

The main elements of the framework that impact on PV are:

- Building regulations
- Codes for “Green buildings”
- Capital subsidies for renewable systems
- Enhanced feed-in tariffs for renewable systems
- National, regional and local planning policy for renewable systems

Building regulations exist in all countries; generally they are neutral regarding their impact on the installation of PV systems, covering such topics as structural safety and insulation levels. However they can be used to require the installation of renewable energy systems. In Spain many larger buildings are now required to have a PV system (this includes: commercial buildings, showgrounds, offices, hospitals, clinics, hotels and hostels) and all buildings are required to have a solar thermal system. In Germany, the building regulations give credit for renewable systems that generate thermal energy, but not for electrical generation systems such as PV. This tends to encourage the installation of solar thermal systems which receive credit under the building regulations, instead of systems that generate electrical renewable energy, such as photovoltaics.

Codes for “green buildings" are available in many countries. In contrast to the compulsory building regulations which have to be applied to all buildings, these are optional. They tend to give credit for the installation of photovoltaic systems and can be an important driver for the inclusion of PV system in buildings. For example, in the UK the Code for Sustainable Buildings credits PV systems and other renewable systems. A minimum Sustainable Buildings rating is now often required by funding bodies that may support regeneration projects or the construction of social housing. This is an important driver in the renewables market in the UK.

Capital subsidies for PV systems are not as common as they were and have been replaced by feed-in tariffs in some countries. Capital subsidies through competitive grant application mechanisms are

still available in the UK through the Low Carbon Buildings Programme and in local and regional schemes in Austria, Germany, France and the Netherlands. An income tax credit system is also available to private individuals in France.

Enhanced feed-in tariffs for photovoltaic systems are available in Spain, Germany and France, which provide a premium rate for all PV electricity. The German Renewable Energy Sources Act (EEG) assures a fixed feed-in-tariff for grid-connected solar electricity over a time span of 20 years. Via the feed-in-tariff (currently ca. 46 cent/kWh, depending on the kind of system) the investment in a PV-system can be recovered during its lifetime with a reasonable return on investment. A limited feed-in tariff based support system is also available in Austria, but it has a limited budget so that only the first few applicants receive funding.

National, regional and municipal planning policies for renewable systems: Planning policies promoting renewable energy tend to be developed, at least at the detailed level, at a municipal or regional level. This may or may not link to a national planning policy for renewable energy.

EXAMPLES OF INTERNATIONAL MUNICIPAL PLANNING POLICIES

AUSTRIA

There are no nationwide directives for the use of Renewable Energy Sources (RES) in the urban planning process or any rules or targets which set a certain percentage of electricity generation from RES for new buildings. Municipal bylaws may include planning requirements to increase energy efficiency of new or retrofit buildings and/or the use of renewable energy sources.

GERMANY

Local authorities may define urban areas where solar energy should be used, based on a national legal framework. It is up to the local authorities to use the legal possibilities to realise urban planning with a focus on a solar development. The City of Marburg is about to launch the first solar obligation concerning thermal systems. This has caused some legal complications and controversy.

FRANCE

There is no specific national policy to encourage the use of RES in the urban planning process. In response to this lack of national policy, some local authorities have implanted local policies. For instance, Greater Lyon drew up on a voluntary basis a local policy to enforce the Rational Use of Energy and the use of RES in new buildings.

NETHERLANDS

Emphasis in the urban planning process lies with the municipalities. City Councils prepare structural plans which provide details of how to transform national and provincial policy into concrete plans.

This leads to the development of an urban design which may prescribe energy performance, sustainability aspects, etc.

SPAIN

Land use legislation and energy planning are the responsibility of the Spanish Regional Governments called "Autonomous Communities" (AC). Within each AC, urban planning is developed at a local level by the Town Councils. The General Urban Distribution Plan is the main tool for urban planning in Spain. Once developed and approved by the Town Council, the proposal must receive the final approval by the Government of the AC in order to come into effect. Regional legislation depends on the ACs. For example, in the case of Madrid's AC, the Energy Plan 2004-2012 aims to double the energy contribution from RES and to reduce CO2 emissions by 10%. Possible actions related to photovoltaics include, the promotion of PV systems in domestic and services sectors, and the support of municipal bylaws. In September 2005, there were more than 30 municipal bylaws concerning solar technologies, most of them only dealing with solar thermal. The region of Catalonia is by far the most active in this field, followed by Madrid and Valencia.

KEY LESSONS & RECOMMENDATIONS FROM INTERNATIONAL EXPERIENCES:

PROACTIVE LEADERSHIP FROM COUNCILS IN ENCOURAGING AND FACILITATING PV IN THEIR AREAS.

While local councils do not often directly control the broad deployment of solar PV technology, they can exert a considerable degree of influence on the ease with which PV projects proceed. Financial incentives and other factors being equal, the areas that have seen comparatively widespread deployment of PV are frequently those that have local authorities which have a well-developed understanding of the technology; on the basis of this they have adopted a positive (or at least not an obstructive) stance towards establishing an enabling environment for PV developments, particularly from the planning approvals perspective.

The establishment of a department or the appointment of a designated officer with clear responsibility for PV (and other renewable energies / energy efficiency), as well as the remit and influence to support planning decisions, should be an objective for all local governments.

KNOWLEDGE OF PV AMONGST PLANNERS.

As with many (development) control issues, individual authority positions as regards PV are established as a result of the specific knowledge of influential staff within the LG body. Imparting the relevant knowledge and ensuring that knowledge is retained or refreshed as may be appropriate is clearly then one of most important issues to address.

This underlines the potential value of a concise, factual, reliable (impartial) information tool which addresses the needs and answers potential concerns of local government decision makers. The value of such a tool going forward depends on maintaining the currency of the knowledge base, for

example by establishing a forum for dialogue including relevant Local Government players (both novices and potential mentors) and representative bodies of the PV community.

An online knowledge portal providing access to basic technology (component) summaries, siting considerations, product safety, system design and other decision tools, as well as relevant case studies would seem to be an effective medium to achieve this.

ACCESSIBILITY OF PLANNERS TO RATEPAYERS AND PERTINENT PLANNING GUIDANCE.

For those tasked with submitting or investigating the need to submit a development application, the accessibility of clear, unambiguous advice is a paramount concern.

Local Government – ideally through a designated officer or responsible department - can ease the Development Approval process for ratepayers (both end users and system installers) by providing simple information, including human resources, to answer a range of basic questions:

- Under what circumstances will full Development Approval be needed?
- What may be considered permitted development?
- What are the planning fees (if any)?
- What forms and other information are required in support of the application?
- How long before the applicant is notified of the planning decision?

A simple decision tree, ideally in the form of an online decision tool could streamline the process for many parties.

From the industry perspective, ideally all local governments would make such information available to an appropriate coordinating body (possibly the Local Government Association in association with Australian PV Association) in order that installers can quickly access current planning requirements for the jurisdictions in which they operate.

Clearly, as for the information tools for local government staff, the benefit of the system is dependent on the advice being maintained and updated on an ongoing basis.

REMOVAL OF FEES.

For standard PV system types (i.e. the majority of domestic and small commercial installations), particularly where the array does not project significantly from the roof and is in the plane of the roof, provided the installation is effected by a recognised professional installer and uses conforming equipment, the DA process should be simple and in many cases may not require any individual attention from the planning department. In such situations there should be an exemption from any planning charges.

Non standard systems may be somewhat more contentious. However, as far as possible - given onsite renewable energy technologies and PV in particular have a broadly beneficial impact on the local environment – planning fees should be waived or minimised in order not to discourage ratepayers from pursuing sensible PV installations.

RECOMMENDATIONS FOR AUSTRALIA

PRELIMINARY IDEAS ON LOCAL GOVERNMENT PROCESSES AND PLANNING

- That all standard PV systems (eg. do not have heritage or other unusual impacts) should not be required to go through the Development Application process.
    - In NSW, revert the SEPP (Infrastructure) to the requirements of the SEPP (Exempt and Complying Development Codes) that PV systems in heritage areas or on heritage buildings are exempt or complying as long as they are not visible from any road frontage, and that equivalent requirements be standardised throughout Australia
    - Councils in NSW could also give consideration to preparing an LEP which says that the SEPP provisions for PV (and SWHs) do not apply in their LGA (councils in other states and territories could take equivalent action).
- Councils provide a clear set of definitions regarding such standard installations which do not require Council approvals.
- Councils work together and with Local Government Associations to standardise procedures across States/Territories and Australia.
- That Councils waive both pre-DA and DA fees, which can then be funded through a broad-based environmental levy.
- That Councils incorporate the option of allowing certain designs of PV systems on heritage buildings and in heritage areas, rather than just not allowing them to be visible from the public domain. To avoid this becoming too subjective, in addition to standard requirements such as the system being parallel to the roof and a maximum distance above it, Councils could provide lists and photos of particular PV types and styles which would meet heritage requirements eg. amorphous PV on a corrugated surface to look like a corrugated roof, transparent glass PV systems or solar 'slate tiles'.
- Councils could allow some leeway in their definition of 'public domain'. For example, they could distinguish between a well used street with house frontages and a back lane that is mainly used for garbage bins and access to rear garages. Thus, a PV system could be on a heritage building even if it is visible from a back lane.
- That Councils make available (to the general public and staff) a document that outlines the approval process, as well as the SEPP (Infrastructure), DCP, and any Building Codes requirements. It could also suggest ways that system owners and installers can make things easier for themselves if they are likely to have to submit a DA – such as ways that they can better integrate their system into a heritage building.
- That Councils make available a technical guideline for use by council staff to give them a better understanding of the operational characteristics of PV. Short training sessions could also be instigated.
- Councils provide ratepayers with information on PV, plus lists of local accredited installers and components approved for use in Australia.
- Training and accreditation standards are vital, as is their nationwide recognition. There are only a handful of installers that operate across state borders, but the variation in council and

utility procedures and trade licensing is a barrier to lowering installation costs. The Ministerial Council on Energy (MCE) is working towards guidelines for standard connection agreements for PV systems; this project is aiming for a similar approach to development approval. Similarly, standardised procedures could be followed in all States, with specific requirements reflecting State legislation.

- A national insurance scheme for accredited installers that recognise the obligations in terms of the roof structure to which they attach a PV system. This would provide the incentive to reduce risk through training and accreditation.
- There does appear to be a role for the industry to engage with councils and provide some confidence in the skills and knowledge of accredited installers. Short courses on PV including explanation of the CEC accreditation procedures may be useful.
- Councils to facilitate bulk purchase programs, taking on board lessons learnt from previous bulk purchase initiatives.
- Industry / Government to produce a photographic guidebook that focuses on the aesthetics of PV installations. This could include examples of different panel types and on different house styles including Heritage buildings.

KEY LESSONS FROM INTERNATIONAL EXPERIENCES:

- Proactive leadership from Councils in encouraging and facilitating PV in their areas, including establishment of a designated energy department or officer.
- Knowledge of PV amongst planners, maintained via reliable and impartial information, as well as access to a network of local government and PV expertise.
- Accessibility of planners to ratepayers and pertinent planning guidance on:
    - What circumstances require full Development Approval?
    - What may be considered permitted development?
    - What are the planning fees (if any)?
    - What forms and other information are required in support of the application?
    - How long before the applicant is notified of the planning decision?
- Removal of fees for standard systems using approved equipment and accredited installers, and minimising fees for other installations in order to encourage PV uptake.

CONCLUSIONS AND RECOMMENDATIONS ON SOLAR ACCESS

- Solar users should be encouraged to make legally binding easements with their neighbours, where possible. The legal efficacy of such easements should be recognised by an amendment to existing State property legislation.
- The existing system of solar access protection under planning and development legislation should be continued, subject to specific reforms (noted in Appendix 4).
- Municipalities should be authorised by State and Territory legislation to establish a system of zoning for solar access purposes and to adopt a system of hypothetical solar fences, as in the City of Boulder, Colorado.

APPENDIX 1: COUNCIL SURVEY

1. Are your Council staff familiar with solar PV?
2. Would you describe your council as being generally supportive of PV installations in your area?
3. If not, are your concerns focussed more on visual aesthetics or safety issues or something else?
4. Do you have any Development Consent requirements over and above state government requirements? If so,
    a. why do you have them?
    b. what are they?
    c. are there any direct council fees charged?
5. Have you developed any procedures or requirements designed to better enable installation of PV systems?
6. Do you provide any information to ratepayers or to Council staff on PV?
7. Would you like to have (more) information? If so, what sort?
8. Have you had any complaints from ratepayers regarding PV, and if so, has this focussed more on visual aesthetics or safety issues or something else?
9. What fees are charged for PV installation applications? Do you have a set fee structure?
10. How long does it normally take for PV installation applications to be processed?
11. Have you had any experience with problems over solar access rights, including any litigation?
12. Do you have any comments or suggestions for improving the approval processes for future PV installations?

APPENDIX 2: INSTALLER SURVEY

1. Do you know of any councils that are either particularly helpful or problematic regarding installation of PV?
2. Do you know of any particular examples of successful or failed installations that would usefully illustrate helpful or problematic actions by councils?
3. In your experience, for residential systems, how long does it normally take for councils to approve PV installation applications? What is the shortest approval time you have experienced? What is the longest approval time you have experienced? Ditto for larger-scale systems, especially commercial.
4. In your experience, for residential systems, what is the average cost of council approval? What is the lowest approval cost you have experienced? What is the highest approval cost you have experienced? Ditto for larger-scale systems.
5. Do you know of any issues that are particularly problematic? eg. heritage areas, building insurance requirements?
6. Do you know of any state government (or territory) requirements that are problematic?
7. Have you had any experience with problems over solar access rights, including any litigation?
8. If information on PV is to be provided to Councils, what should it contain?
9. Do you have any comments or suggestions for improving Council processes for future PV installations?

APPENDIX 3: SUMMARY OF RELEVANT LEGISLATION

NEW SOUTH WALES

NSW State Environmental Planning Policy (Infrastructure) 2007

Current version for 24 April 2009 to date

Part 3 Division 4 Clause 37

37 Complying development

Development for the purpose of a photovoltaic system or solar hot water system that is associated with an existing building for which the system generates electricity or hot water is complying development on any land if the development:

(a) does not necessitate the removal of trees from near the building to ensure solar energy is available, and

(b) does not create excessive glare or reflection onto any adjacent building, and

(c) does not block views or otherwise adversely affect any adjacent property, and

(d) is not located on a building that is a State or local heritage item or is in a heritage conservation area.

Note. Some development for the purpose of photovoltaic systems or solar hot water systems is exempt development—see clause 39.

NSW State Environmental Planning Policy (Infrastructure) 2007

Current version for 24 April 2009 to date

Part 3 Division 4 Clause 39

39 Exempt development

(1) Development for the purpose of a photovoltaic system or solar hot water system for a building is exempt development if it complies with clause 20 (2) (Exempt development) and all of the following requirements are met:

(a) the system is integrated into the building or is flush or parallel with the surface of its roof,

(b) the development does not:

(i) reduce the structural integrity of, or involve structural alterations to, the building, or

(ii) necessitate the removal of trees from near the building to ensure that solar energy is available for the system,

(c) on average, over any 5 year period, at least 75 per cent of the electricity generated by the system in a 12 month period is used in or for the building,

(d) the system is not located on a building that is a State or local heritage item or is in a heritage conservation area.

(2) Development for the purpose of a wind monitoring tower used in connection with the investigation or determination of the feasibility of a wind farm is exempt development if:

(a) it complies with clause 20 (2) (Exempt development), and

(b) the tower:

(i) is erected in accordance with the manufacturer's specifications, and

(ii) has a height of not more than 110m, and

(iii) is removed within 30 months after its erection is completed, and

(c) the site of the tower:

(i) is enclosed by a fence that prevents unauthorised entry to the site, and

(ii) is not within 100m of any public road, and

(iii) is not within 1km of any other wind monitoring tower or a school, and

(iv) is not within 1km of any dwelling except with the prior written permission of the owner of the dwelling, and

(v) is not within 500m of any State heritage item, and

(vi) does not affect a significant view to or from any such item that is identified in a conservation management plan (as defined by clause 3 of the *Heritage Regulation 2005*) for the item, and

(d) before the tower is erected, the Civil Aviation Safety Authority (established under the *Civil Aviation Act 1988* of the Commonwealth) is notified in writing of:

(i) the tower's "as constructed" longitude and latitude co-ordinates, and

(ii) the ground level elevation at the base of the tower, referenced to the Australian Height Datum, and

(iii) the height from ground level (existing) to the topmost point of the tower (including all

attachments), and

(iv) the elevation to the top of the tower (including all attachments), referenced to the Australian Height Datum, and

(v) the date on which it is proposed to remove the tower.

NSW State Environmental Planning Policy (Infrastructure) 2007

Current version for 24 April 2009 to date

Part 2 Division 4 Clause 20

20 Exempt development

Note. Under section 76 of the Act, exempt development may be carried out without the need for development consent under Part 4 of the Act or for assessment under Part 5 of the Act.

The section states that exempt development:

(a) must be of minimal environmental impact, and

(b) cannot be carried out in critical habitat of an endangered species, population or ecological community (identified under the *Threatened Species Conservation Act 1995* or the *Fisheries Management Act 1994*), and

(c) cannot be carried out in a wilderness area (identified under the *Wilderness Act 1987*).

(1) Development for a purpose specified in Schedule 1 is exempt development if:

(a) it is carried out by or on behalf of a public authority, and

(b) it meets the development standards for the development specified in Schedule 1, and

(c) it complies with the requirements of this clause.

(2) To be exempt development, the development:

(a) must meet the relevant deemed-to-satisfy provisions of the *Building Code of Australia*, and

(b) if it is carried out in relation to an existing building, must not cause the building to contravene the *Building Code of Australia*, and

(c) must be carried out in accordance with all relevant requirements of the Blue Book, and

(d) must involve no more than minimal impact on the environment or amenity of the surrounding area, and

(e) if it is likely to affect a State or local heritage item or a heritage conservation area, must involve no more than minimal impact on the heritage significance of the item or area.

Note. Other provisions of this Policy identify kinds of development that are exempt development if they meet the requirements of subclause (2).

NSW State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

Historical version for 12 December 2008 to 26 February 2009

Part 2 Division 1 Subdivision 38

Subdivision 38 Solar water heaters and photovoltaic systems

2.75 Specified development

The construction or installation of a solar water heater or photovoltaic system is development specified for this code.

2.76 Development standards

The standards specified for that development are that the development must:

(a) be constructed or installed so that any service opening created is adequately weather proofed, and

(b) be integrated into the building or be flush or parallel with the surface of the roof of the building, and

(c) not involve work that reduces the structural integrity of the building, and

(d) if it is constructed or installed on or in, or in relation to, a heritage item or a draft heritage item or is constructed or installed in a heritage conservation area or a draft heritage conservation area—not be visible from any road frontage.

NSW State Environmental Planning Policy (Infrastructure) 2007

Current version for 24 April 2009 to date (accessed 27 April 2009 at 12:05)

Part 3 Division 3 Clause 31A

31A Complying development—existing schools and TAFE establishments

(1) Development carried out by or on behalf of any person on land within the boundaries of an existing school or TAFE establishment is complying development if:

(a) it is carried out for the purpose of the construction of, or alterations or additions to, any of the following:

(i) a library or an administration building,

(ii) a gym, indoor sporting facility or hall,

(iii) a classroom, lecture theatre, laboratory, trade or training facility,

(iv) a tuckshop, cafeteria, bookshop or child care facility to provide for students or staff (or both),

(v) a car park, and

(b) it complies with the requirements of this clause.

(2) To be complying development, the development must:

(a) be permissible, with consent, in the zone in which it is carried out, and

(b) meet the relevant deemed-to-satisfy provisions of the *Building Code of Australia*, and

(c) not be carried out within 1m of any public sewer except with the written approval of the authority that has management or control of the main.

Note. Section 76A of the Act also provides that certain development cannot be complying development.

(3) Development is not complying development if it can be carried out on the land without consent.

Note. Clause 29 sets out the types of development that may be carried out by or on behalf of a public authority in connection with existing educational establishments without consent.

(4) The following are the development standards for complying development under this clause:

(a) **Building height standard.** The building height of a building must not exceed 12m.

(b) **Side and rear setback standard.** A building must be located at least 5m from any side or rear boundary of the land.

(c) **Materials standard.** Any new external walls or roof of a building must be constructed of non-reflective material.

(d) **Noise standard.** A building to be used for the purpose of a gym, indoor sporting facility or hall that is located less than 20m from a common boundary with land zoned residential must be designed to meet the acoustic performance elements contained in item 11.05.e of the State government publication *School Facilities Standards—Design Standard—Version 1/09/2006*.

(e) **Overshadowing standard.** A building must not overshadow any adjoining residential property so that:

(i) solar access to any habitable room on the adjoining property is reduced to less than the minimum level (being 2 hours of solar access between 9 am and 3 pm at the winter solstice) or is reduced in any manner (if solar access to any habitable room on the adjoining property is already below the minimum level), or

(ii) solar access to the principal private open space of the adjoining property is reduced to less than the minimum level (being 3 hours of solar access to not less than 50% of that principal private open space between 9 am and 3 pm at the winter solstice) or is reduced in any manner (if solar access to the principal private open space of the adjoining property is already below the minimum level).

SOUTH AUSTRALIA

The South Australian Government is introducing a range of reforms to the state's Planning System in 2009. Part of this is a series of amendments to the *Development Act 1993* and *Development Regulations 2008* to increase the matters that are complying development, exempt development and development requiring building consent only (Residential Development Code). These amendments came into operation on March 1st, 2009 and included residential rooftop PV installations.

The media release is available here: www.planning.sa.gov.au/go/news/solar-panels-exempt-from-planning-approval

More information on the Residential Development Code is available here: www.dplg.sa.gov.au/html/resdevcode.cfm

The Development Regulations are available here: www.legislation.sa.gov.au/LZ/C/R/DEVELOPMENT REGULATIONS 2008.aspx

Development Regulations 2008

under the *Development Act 199*

Development Regulations 2008—1.3.2009

Schedule 1A—Development that does not require development plan consent

10—Solar photovoltaic panels

The installation, alteration, repair or maintenance of a system comprising solar photovoltaic panels on the roof of a building (after taking into account the operation of clause 15 of Schedule 3) if—

(a) the panels (and any associated components) do not overhang any part of the roof; and

(b) the panels are fitted parallel to the roof with the underside surface of the panels being not more than 100 millimetres above the surface of the roof; and

(c) if the building is in a Historic Conservation Zone/Area—no part of the system, when installed, will be able to be seen by a person standing at ground level in a public street.

1.1.2009—Development Regulations 2008

Acts and activities which are not development—Schedule 3

15—Solar photovoltaic panels

(1) Subject to subclause (2), the installation, alteration, repair or maintenance of a designated photovoltaic system on the roof of a building.

(2) Subclause (1) does not apply if the place where the designated photovoltaic system is installed is a local heritage place if, when installed, it is able to be seen by a person standing at ground level in a public street.

(3) In this clause—

designated photovoltaic system means—

(a) a photovoltaic system comprising solar photovoltaic panels that have a total weight not exceeding 100 kilograms; or

(b) a photovoltaic system comprising solar photovoltaic panels that have a total weight exceeding 100 kilograms if—

(i) the weight load is distributed so that it does not exceed 100 kilograms at any 1 point of attachment to the roof; and

(ii) the panels (and any associated components) do not overhang any part of the roof; and

(iii) the panels are fitted parallel to the roof with the underside surface of the panels being not more than 100 millimetres above the surface of the roof; and

(iv) the panels are installed by a person who holds an accreditation under a scheme recognised by the Minister for the purposes of this paragraph.

NORTHERN TERRITORY PLANNING AND DEVELOPMENT REGULATION

General

In the past, it has been generally accepted in the building industry that building approval was not required for the installation of solar hot water heaters (SHWH) providing they are products included in the Deemed to Comply Manual (DTCM) and installation is in accordance with the DTCM. However, with the introduction of status reports on buildings prior to the building being sold, it has brought to light that the SHWH are being classed as unauthorised building work if they don't appear on the building permit plans. No official policy has previously been developed and the Building Advisory Services Branch has not previously considered requirements in relation to the installation of Solar Hot Water Heaters. This policy is intended to formalise the approval requirements and establish specific guidelines for the installation of these products.

Concession for the Installations of Solar Hot Water Heaters

1. For installations in **Cyclonic areas** (up to 100km from the coast line) -

Building Approval is not required for the installation of solar hot water heaters subject to the following:-

The solar hot water heater must be referenced in the Northern Territory "Deemed to Comply Manual" (DTCM) and installation must be in accordance with the appropriate DTCM sheet for that product; and

a) The roof trusses have been modified to support the SHWH in accordance with the truss manufactures specifications or
b) A NT registered structural engineer has certified the structural adequacy of the supporting roof system, providing upgrading if required.

Note: Any plumbing work associated with the installation of the solar water heater must be installed and certified by a licensed plumber.

2. For installations in **Non-cyclonic areas** (more than 100km from the coast line including the Adelaide River Township and beyond) -

Building Approval is not required for the installation of solar hot water heaters subject to the following:-

The solar hot water heater must either be *'Type Approved under Regulation 3(2)(a)'* by the Director Building Control or referenced in the Northern Territory "Deemed to Comply Manual" (DTCM) and installation must be in accordance with the appropriate *'Type Approved under Regulation 3(2)(a)'* by the Director Building Control or the DTCM sheet for that product; and

a) the roof trusses have been modified to support the SHWH in accordance with the truss manufactures specifications or
b) A NT registered structural engineer has to certify the structural adequacy of the supporting roof system, providing upgrading if required or.

ACT PLANNING AND DEVELOPMENT REGULATION

2008 made under the Planning and Development Act 2007

Current version for 8 May 2009 to date

Schedule 1 Exemptions from requirement for development approval

Part 1.3 Exempt developments

Division 1.3.1 Exempt developments—minor building works

1.27 External photovoltaic panels, heaters and coolers

(1) A designated development for an externally mounted service for a block if—

(a) no part of the service is within 1.5m of a side boundary or rear boundary of the block; and

(b) if the service is mounted on a roof—the distance from the top of the service to the closest point of the roof is not more than 1.5m; and

(c) if the service is mounted on the ground—no part of the service is between a front boundary and a building line for the block; and

(d) the designated development complies with the general exemption criteria that are applicable to the development.

Note 1 Designated development—see s 1.2.

Note 2 General exemption criteria—see s 1.10.

(2) In this section: service—

(a) means a photovoltaic panel, solar water heater, air conditioner or evaporative cooler; and

(b) includes the support structures (if any) for the panel, heater, air conditioner or evaporative cooler.

Schedule 1 Exemptions from requirement for development approval

Part 1.1 Preliminary

1.2 Meaning of designated development—sch 1

In this schedule:

designated development, in relation to land, means—

(a) building, altering or demolishing of a building or structure on the land; or

(b) carrying out earthworks or other construction work on or under the land; or

(c) carrying out work that would affect the landscape of the land.

Part 1.2 General exemption criteria

1.10 Exempt developments—general criteria

The following are the general exemption criteria for a development:

(a) section 1.11 (Criterion 1—easement and other access clearances);

(b) section 1.12 (Criterion 2—plumbing and drainage clearances);

(c) section 1.13 (Criterion 3—metallic, white and off-white exterior finishes in residential zones);

(d) section 1.14 (Criterion 4—heritage and tree protection);

(e) section 1.15 (Criterion 5—compliance with lease and other development approvals);

(f) section 1.17 (Criterion 7—no multiple occupancy dwellings);

(g) section 1.18 (Criterion 8—compliance with other applicable exemption criteria).

1.11 Criterion 1—easement and other access clearances

(1) A development must not cause any part of a building or structure to be located in—

(a) an easement or proposed easement; or

(b) a utility infrastructure access or protection space.

(2) In this section:

easement means an easement registered, or shown on a certificate of

title, under the Land Titles Act 1925.

proposed easement means a proposed easement shown on a deposited plan under the Districts Act 2002 or units plan under the Unit Titles Act 2001.

utility infrastructure access or protection space means the space required under a utility rule—

(a) for a utility operator to have access to its infrastructure; or

(b) to protect or maintain clearances from utility infrastructure such as water supply pipes, sewerage systems, gas pipes and electricity conductors.

Examples

1 The electricity service and installation rules made under the Utilities Act 2000 require buildings or other structures to be kept clear of power lines by a stated dimension, to protect the powerlines from damage or to protect the electricity supply from interruption.

1.13 Criterion 3—metallic, white and off-white exterior finishes in residential zones

(1) The building or alteration of an external wall or roof of a building or structure must not cause any part of the exterior of any metal lining sheet for the wall, or metal roofing sheet, to have a metallic, white or off-white finish.

1.14 Criterion 4—heritage and tree protection

A development must not contravene—

(a) the Heritage Act 2004; or

(b) the Tree Protection Act 2005.

Note Other applicable laws must also be complied with (see s 1.4).

1.15 Criterion 5—compliance with lease and other development approvals

(1) A development (the relevant development) must not be inconsistent with—

(a) a condition of a development approval for another development on the block to which the relevant development relates; or

(b) a provision of the lease to which the relevant development relates; or

(c) an agreement collateral to the grant of a lease to which the relevant development relates.

Example

a land management agreement (see Act, s 283)

Note An example is part of the regulation, is not exhaustive and may extend, but does not limit, the meaning of the provision in which it appears (see Legislation Act, s 126 and s 132).

(2) For subsection (1) (a), a provision of a development approval is taken to be a condition of the approval only if the approval is expressed to be given on the condition that the provision is complied with.

Example—condition

Development plans do not include windows in the front wall. The approval is expressed to be subject to the condition that the front wall not have windows.

Example—not a condition

Development plans do not include windows in the front wall. The approval is given without explicit mention of windows in the front wall being a condition of the approval.

Note An approval may be given subject to conditions, see the Act, s 165 (Conditional approvals).

1.17 Criterion 7—no multiple occupancy dwellings

A development must not increase the number of dwellings on a block to 2 or more dwellings.

1.18 Criterion 8—compliance with other applicable exemption criteria

A development must comply with any other criteria in part 1.3 (Exempt developments) that apply to the development.

Examples—other criteria applying to development

1 changing a house roof from metal sheet to tiles (see s 1.22) must also comply with the criteria in section 1.24 (Buildings—roof slope changes)

2 the replacement of a roof flue for a building (see s 1.22) must also comply with section 1.25 (Buildings—chimneys, flues and vents)

Note An example is part of the regulation, is not exhaustive and may extend, but does not limit, the meaning of the provision in which it appears (see Legislation Act, s 126 and s 132).

DRAFT ACT HERITAGE GUIDELINES 2007

This edition was made by the ACT Heritage Council under s.25(1) of the Heritage Act 2004 and duly presented to the ACT Legislative Assembly.

Relevant Extra

B.1-4.0 ROOFS

Mandatory Conservation Requirements

B.1-4.5 An original chimney shall be retained, regardless of internal modifications.

B.1-4.9 New services such as but not limited to solar hot water heaters, ventilators, antennae, and satellite dishes shall not be visible from the public domain.

B.4-5.0 UTILITIES AND SERVICES

Mandatory Conservation Requirements

B.4-5.5 The Statement of Heritage Effects (SHE) shall outline the steps to be taken to avoid or minimise any adverse impact on significant features. The SHE shall address matters such as, but not confined to:

- design of heating and cooling systems so as to minimise the potential for damage to significant features
- siting of external fixtures such as switch and meter boards, solar collectors, aerials, satellite dishes, water tanks, heating and cooling units so as not to be visible from the public domain
- location of internal fixtures such as switchboards, indicator panels, hose reels, extinguishers etc in areas of low significance or, where unavoidable in areas of high significance, so as to be as unobtrusive as possible.

Requirements subject to the discretion of the decision maker

B.4-5.12 External fixtures such as switch and meter boards, solar collectors, aerials, satellite dishes, water tanks, heating and cooling units and associated vents and pipe work should be located in unobtrusive areas, such as within the building, in sub-floor spaces, roof spaces, or on external walls or roofs which are not visible from the public domain.

APPENDIX 4: SOLAR ACCESS LAW IN AUSTRALIA AND INTERNATIONALLY

Professor Adrian Bradbrook, Law School, University of Adelaide

1. BACKGROUND TO SOLAR ACCESS LAW

1.1 The inadequacies of the laws protecting solar access were exposed in Australia as long ago as 1977 by the Senate Standing Committee on Natural Resources and in the following year in a Discussion Paper by the Law Reform Committee of South Australia (as it then was).[15] Despite these reports there have been relatively few new developments in this area of the law and no comprehensive reform of the relevant law in any Australian State or Territory. The only significant change in modern times is that solar access has now been declared by State legislation as a relevant factor in planning and development decisions, but it has been left to the individual local development authorities to determine its significance in each individual case in light of the surrounding circumstances. In contrast, there have been fundamental legislative changes at both Federal and State levels over the past thirty years affecting most other forms of energy and mineral resources.

2. COMMON LAW PROTECTION OF SOLAR ACCESS

2.1 A number of writers in the late 20th century have discussed the extent to which common law can protect solar access by using existing property law principles.[16] Thus, using the law of easements it is possible for a solar user to guarantee his or her right of solar access by entering into an agreement with the neighbour whereby the neighbour would agree not to shade a particular area of the solar user's roof or other area of the block of land during certain periods of the day. Alternatively, it is possible for solar users and their neighbours to enter into a restrictive covenant whereby the neighbour covenants (promises) to protect from shading a designated area of the solar user's land or airspace above the land.

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[15] Law Reform Committee of South Australia, *Solar Energy and the Law in South Australia*, Discussion Paper, Adelaide, 1978.

[16] A Bradbrook, "The Development of an Easement of Solar Access" (1982) 5 *University of New South Wales Law Journal* 22; T Williamson and S Coldicutt, "Solar Access in South Australia" (1990) 7 *Environmental & Planning Law Journal* 30; A Preece, "Renewable Energy: Legal Issues" [2000] *Australian Mining and Petroleum Law Association Yearbook* 306; J Goudkamp, "Securing Access to Sunlight : The Role of Planning Law in New South Wales" (2004) 9 *Australasian Journal of Natural Resources Law and Policy* 59; T Alvarez, "Don't Take My Sunshine Away: Right to Light and Solar Energy in the Twenty-First Century" (2008) 28 *Pace Law Review* 535.

2.2 Under land titles legislation in all States and Territories, both easements and restrictive covenants can be registered by the solar user as a charge on neighbouring land.[17] The effect of this is that the solar right thus created will be protected indefinitely against all future purchasers of the neighbouring land. As such, easements and restrictive covenants are capable in theory of being an effective form of legal protection against the overshadowing of solar collector panels. Unfortunately, in practice such property law rights are of only limited use as a means of solar access protection. Easements and restrictive covenants are consensual transactions and require the consent of the neighbour to legally burden his or her land. Such consent would normally only be given on the payment of a substantial price. Neighbours cannot be forced at common law to enter into such agreements. An exception to this exists under legislation in Queensland, New South Wales and Tasmania, where in certain circumstances new easements can be imposed on neighbouring land where it is shown to be in the public interest or "in the interests of the effective use in any reasonable manner of any land". The relevant legislation is the Property Law Act 1974 (Qld), section 180, the Conveyancing Act 1919 (NSW), section 88K, and the Conveyancing and Law of Property Act 1884 (Tas), section 84J. The existing case law interpreting this legislation shows that it is highly unlikely that the courts would allow the legislation to apply in cases of solar access.[18] It is unlikely that neighbours would voluntarily agree to the imposition of such a legal burden for fear that the existence of the easement or restrictive covenant on their land title would substantially diminish the value of their real estate and would deter later purchasers of the burdened land because of the developmental restrictions thus imposed.

2.3 There are also lingering legal doubts under Australian common law as to whether an easement of solar access would be legally recognised. While the weight of authorities would suggest that such rights would be valid, the courts are traditionally wary of creating new property rights or extending existing ones. Lord Denning in the English Court of Appeal has suggested that the class of possible easements is now closed.[19] While there are dicta of the High Court of Australia in *Commonwealth v Registrar of Titles for Victoria*[20] as long ago as 1918 and of the Judicial Committee of the Privy Council dating back to the 1915 decision in *Attorney-General of Southern Nigeria v John Holt & Co Ltd*[21] suggesting the opposite, any such lingering doubts would render the use of common law property rights to protect solar access as theoretical rather than practical.

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[17] Real Property Act 1900 (NSW); Transfer of Land Act 1958 (Vic); Real Property Act 1886 (SA); Land Title Act 1994 (Qld); Transfer of Land Act 1893 (WA); Land Titles Act 1980 (Tas); Land Titles Act 1925 (ACT); Land Title Act (NT). Restrictive covenants cannot be registered on land titles in Queensland and South Australia.

[18] See *Re Seaforth Land Sales Pty Ltd's Land* [1976] Qd R 190; *Re Worthston Pty Ltd* [1987] 1 Qd R 400; *Tipler v Fraser* [1976] Qd R 272; *Re Permanent Trustee Australia Ltd* (1997) 8 BPR 15,551.

[19] *Phipps v Pears* [1965] 1 QB 76.

[20] (1918) 24 CLR 348.

[21] [1915] AC 599.

2.4 Another possible common law means of protecting solar access is the law of private nuisance.[22] This has been defined as "the unlawful interference with a person's use or enjoyment of land, or of some right over, or in connection with it".[23] In the solar access context, the major obstacle for the solar user to overcome before he or she can succeed in an action for nuisance is to prove that the blocking of solar access from the solar collector panels constitutes an interference with the reasonable use and enjoyment of the land. As the blocking of solar access is an "intangible interference" with the land, it is also necessary to prove that the interference is "substantial".[24] A detailed analysis elsewhere of the common law on this point has concluded that except in cases where a neighbour obstructs solar collector panels solely out of malice, under existing Australian common law rules, it is uncertain whether and under which circumstances the solar user has a remedy in nuisance against his or her neighbours for the blocking of solar access. Malice is extremely unlikely to arise in this context. The only situation in which the solar user has an assured remedy in nuisance is where the right of solar access is protected by an easement.

2.5 Common law rules are not inflexible, however. A modern development in the United States shows the extent to which the courts could modify the application of the law of nuisance in order to protect the right of solar access. The relevant case is *Prah v Maretti*.[25] This case concerned an action by the plaintiff, who had recently constructed an active solar space and water heating system in his house, to restrain his neighbour from constructing a house on his own land in such a position as to shade the solar collector panels on the plaintiff's land. The plaintiff claimed, inter alia, that as the defendant's proposed residence blocked solar access it constituted a private nuisance. The Supreme Court of Wisconsin, in a pioneering two to one decision, rejected the plaintiff's argument that the common law doctrine of private nuisance was inapplicable to protect solar access and refused to follow earlier decisions that in the absence of an express agreement granting access to sunlight, a landowner's obstruction of another's access to sunlight is not actionable on the ground that these decisions are in conflict with modern social priorities. Three arguments were used to justify this stance: (1) society has increasingly regulated the use of land by the owner for the general welfare; (2) solar access has taken on an increased significance in recent years; and (3) the policy of favouring unhindered development in an expanding economy is no longer in harmony with the realities of modern society. The court rejected the argument that because the defendant's proposed house was in conformity with zoning regulations and building codes, the defendant's use of the land could not be said to be unreasonable. It was held that a landowner's compliance with zoning and building laws does not automatically bar a nuisance claim although compliance with the law is entitled to some weight.

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[22] See A Bradbrook, *Solar Energy and the Law* (1984), ch 6; A Bradbrook, "Nuisance and the Right of Solar Access" (1983) 15 *University of Western Australia Law Review* 148.

[23] *Howard v Walker* [1947] 2 All ER 197 at 199, per Lord Goddard CJ.

[24] *Munro v Southern Dairies Ltd* [1955] VLR 332; *Halsey v Esso Petroleum Co Ltd* [1961] 2 All ER 145.

[25] (1982) 108 Wis 2d 223; 321 NW 2d 182.

2.6 This decision was not followed by the California Sixth District Court of Appeals in *Sher v Leiderman*.[26] In this case, the plaintiff constructed a passive solar home,[27] designed to take advantage of the winter sun for heat and light. Trees planted by a neighbour on adjoining land grew sufficiently tall to block the sun to the plaintiff's house for most of the day during winter. The plaintiff argued that the shading constituted a private nuisance. The court held in favour of the defendant, despite accepting that sunlight is important as an energy source and that the promotion of solar energy is of paramount public interest.[28] The court reasoned that it is more appropriate to protect solar access by zoning and other local ordinances than by the law of nuisance, and that it is solely within the province of the legislature to assess the relative importance of social priorities and decide whether to change the law. The court also noted that the expansion of the nuisance law in this area would have the undesired effect of fostering ill will and a proliferation of litigation between neighbours.

2.7 There are no direct case law authorities on this issue outside the United States. It is doubtful on analogous authorities whether the Australian courts will disregard the established principles of the law of private nuisance, which seem to prevent a successful action in nuisance by a solar user except in exceptional circumstances, in order to provide a remedy based on policy considerations. Interesting though this development is, in light of the limited role of judicial law-making and the past conservatism of the Australian courts, it is submitted that the necessary changes to the law of solar access are most unlikely to develop through the case law process in this country. Any legal right of solar access will likely require legislative intervention.

3. THE CURRENT STATE OF SOLAR ACCESS LEGISLATION IN AUSTRALIA

3.1 The common law rules discussed above relate to property law and, as we have seen, have only limited practical application to solar access protection. There are no legislative changes in the field of property law in Australia that concern solar access. Instead, the focus has been on protecting solar access by the use of planning and development laws. These are all State- and Territory-based as the Commonwealth parliament has no legislative powers over planning and development issues under section 51 of the Constitution. There is no uniformity in the planning and development legislation between the States and Territories. It is thus necessary to study the relevant legislation and its application to solar access separately in respect of each jurisdiction. For the purposes of this study, we will examine the relevant law in two States, South Australia and New South Wales. The reforms that will be suggested can be adopted in the relevant legislation and development controls in all the States and Territories.

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[26] (1986) 181 Cal App 3d 645, 226 Cal Rptr 698.

[27] A passive solar device does not employ any solar collector panels or mechanical devices, but seeks to control temperature by the architectural features of the building itself. Such features include the size and placement of windows, the type of materials of which the walls are constructed, and the orientation of the building towards the sun.

[28] 226 Cal Rptr 698 at 702.

3.2 NEW SOUTH WALES

3.2.1 The operative framework legislation for the State planning and development system is the Environmental Planning and Assessment Act 1979 (as amended) and the Environmental Planning and Assessment Regulation 2000. Part 3 of the Act provides for the making of environmental planning instruments. Section 26 specifies the matters in respect of which any such instrument may make provision. One of these matters is "controlling (whether by the imposing of development standards or otherwise) development" (section 26(b)). "Development" is defined in section 4(1) as including "the erection of a building on that land", and "development standards" is defined in the same sub-section as including requirements or standards in respect of "the effects of development on patterns of wind, sunlight, daylight or shadows". This latter clause is one of the most explicit references in any Australian State or Territory legislation to the need to protect solar access.

3.2.2 In relation to the preparation of a State environmental planning policy and/or a regional environmental plan, section 37 empowers the Director-General of the Department of Planning, either on his or her own initiative or by Ministerial direction, to prepare a State environmental planning policy, while section 40 similarly empowers him or her to prepare a draft regional environmental plan. Similarly, solar access may be taken into account in any draft local environmental plan prepared pursuant to section 54. Where this occurs, the local council is required to prepare an environmental study of the land to which the draft applies (section 57(1)) and must prepare it "in accordance with such specifications, if any, relating to the form, content and preparation of the study as have been notified to the council by the Director-General". This latter sub-section justifies the Director ordering a consideration of the need to protect solar access.

3.2.3 Section 79C(1) specifies in detail the matters that a consent authority (normally the local council) may take into account when considering whether to consent to a proposed development. Paragraph (a) requires the authority to consider:

> "the provisions of –
>
> (i) any environmental planning instrument;
> (ii) any draft environmental planning instrument …;
> (iii) any development control plan…;
>
> ……
>
> that apply to the land to which the development application relates".

As already noted, these various documents may include a consideration of the need to protect solar access, and if they do, it follows that solar access will also be taken into account by the consent authority.

3.2.4 The writer has undertaken an analysis of the local environmental plans currently in effect in New South Wales to determine the extent to which they contain provisions safeguarding solar access. While the majority of such plans contain one or more relevant provisions, there is much variation between the forms of protection offered in each municipality and considerable scope for improvement.

PROBLEMS OF TERMINOLOGY

3.2.5 An initial problem with the terms of the current local environmental plans (LEPs) is that the relevant terminology in many cases leaves it unclear whether the controls are intended to protect solar access simply for the amenity of avoiding overshadowing of neighbouring properties or to provide opportunities for energy generation by solar water heaters or PV devices. The LEPs variously use the terms "overshadowing" and "solar access", but the definition sections in the documents do not define the meaning of these terms.

3.2.6 In some LEPs both terms are mentioned, but it is clear from the context that in reality it is only the amenity of sunlight that is being referred to. An illustration is the Gosford City Centre LEP 2005, reg 18:

> "(1) The objectives of the building height limitations and requirements are:
>
> ……
>
> (f) to provide quality internal environments that optimise solar access and facilitate future adaptability of uses, and
> (2) General height limitations. The consent authority must not grant consent for a building that exceeds the height shown on the Building Heights Map in relation to the relevant land.
> (3) Despite subclause (2), consent may be granted for a building that exceeds the specified height by what the consent authority considers to be a minor amount, but only if the consent authority is satisfied that the additional height is required to facilitate an architectural roof feature that:
> ……
>
> (g) will have minimal overshadowing impact.
> ……
>
> (6) Any part of a building located on the western side of Mann Street, between Donnison and Erina Streets, that is above 10.5 metres in height is to be set back at least 20 metres from the eastern boundary so as to ensure the maintenance of views to President's Hill and to ensure that there will be no **overshadowing** of William Street Mall greater than could occur on the commencement of this plan.

(7) Any part of a building located on the south-western corner of the intersection of Donnison Street and Dane Drive that is above 10.5 metres in height is to be set back at least 10 metres from the southern property boundary so as not to cause overshadowing to the adjoining bowling greens."

3.2.7 The State Environmental Planning Policy (Infrastructure) 2007, reg 31A, which concerns complying development for existing schools and TAFE establishments similarly confuses these terms..

3.2.8 In other LEPs only the term "solar access" is used, but it is overshadowing that is meant. An illustration is the Willoughby LEP 1995, reg 14A:

"14A Low density residential areas-Zones 2 (a), 2 (a2)

General Objectives

(c) To retain and enhance residential amenity, including views, solar access, aural and visual privacy and landscape quality, ….".

3.2.9 In some LEPs the use of the term "solar access" does not make it clear whether it is limited to overshadowing or goes beyond this. The Shoalhaven Local Environmental Plan 1985, reg 40K states:

"(3) A development control plan complies with this clause if it contains or deals with all of the following:

(a) urban design principles to apply to the development in relation to the built form, character and siting of buildings, building envelopes (including heights and setbacks), landscaping, the interface between buildings and the existing and proposed public domain, views, privacy, solar access and security, and other design elements, with an explanation of how they relate to an analysis of the land to which this clause applies and its context,

…….

(c) proposals relating to the mitigation of environmental impacts, including noise attenuation, flood mitigation, water and soil management, remediation of contaminated land, solar access, energy efficiency and environmental sustainability,…"

3.2.10It is only in a small minority of LEPs that the document specifically clarifies that solar access to energy purposes is included in the relevant considerations. The Warringah LEP 2000, reg 68 states:

"**68 Conservation of energy and water**

Development is to make the most efficient use of energy and water. In particular:

• the orientation, layout and landscaping of buildings and works and their sites are to make the best use of natural ventilation, daylight and solar energy,

• site layout and structures are to allow reasonable solar access for the purposes of water heating and electricity generation and maintain reasonable solar access to adjoining properties,….".

GENERAL PROVISIONS RELATING TO OVERSHADOWING

3.2.11The most common relevant provision in LEPs in New South Wales is a simple statement that the prevention of overshadowing is a relevant development objective. While the primary goal of this type of provision is to ensure the amenity of sunlight, such provisions can still incidentally benefit users of solar energy devices by way of guaranteeing solar access to collector panels. An example of a provision of this nature is the Land Cove LEP 1987, reg 9, which reads:

"Zone No 2 (b) (Residential "B" Zone)

1 Objectives of zone The objectives are to provide for medium density residential development and to retain the existing residential amenity and streetscape. Townhouse or villa home development which will maintain the existing street character and will be sympathetic to the neighbourhood in relation to setback, building mass and style, views, dwelling colour, landscaping, the provision of adequate off-street car parking and minimum overshadowing of neighbouring development will be permitted within the zone.

Zone No 2 (b1) (Residential "B1" zone)

1 Objective of zone The objectives are:

(b) to provide for residential development which will by sympathetic to the neighbourhood in relation to setbacks, building mass and style, views, dwelling colour, landscaping, and the provision of off-street car parking and with minimum overshadowing of neighbouring development, and

Zone No 2 (c) (Residential "C" Zone)

1 Objectives of zone The objective is to retain the existing high level of residential development. Development for the purposes of villa homes, townhouses and residential flat buildings which is sympathetic to the neighbourhood in relation to setbacks, building mass, views, dwelling colour, off-street parking, landscaping and overshadowing of neighbouring development will be permitted within the zone."

3.2.12 Another, more simply stated provision of this nature, is the Woollahra LEP 1995, reg 12AA:

"**12AA Objectives of maximum building height development standards**

"The objectives of the maximum building height development standards set by clause 12 are as follows:

……..
(d) to minimise detrimental impacts on existing sunlight access to interior living rooms and exterior open space areas and minimise overshadowing**".**[29]

OVERSHADOWING AT CERTAIN TIMES OF THE DAY

3.2.13 A number of LEPs go beyond simple overshadowing provisions to include a reference to the need to prevent overshadowing at certain times of the day. From a solar energy perspective, this is more significant as energy is mostly generated in a six-hour period centered around the apogee of the sun in its diurnal cycle, and shadows are the longest and therefore of greatest concern in winter, when the sun is at its lowest point in the sky. The North Sydney LEP 1989, schedule 6, dealing with complying development, states:

"**TABLE A: DETACHED SINGLE STOREY DWELLINGS-not in Heritage Conservation Areas**

DESIGN ELEMENT-BULK AND SCALE

[29] See also Penrith City Centre LEP 2008, regs 21 and 23; Sutherland Shire LEP 2000, reg 34; Rockdale LEP 2000, reg 30; Newcastle City Centre LEP 2008, reg 21; Wollongong City Centre LEP 2007, reg 21; Gosford City Centre LEP 2007, reg 21; Auburn LEP 2000, reg 17; Bankstown LEP 2001, reg 45; Griffith LEP 2002, reg 29.

• No increase in overshadowing to principal area of ground level private open space or habitable rooms of any adjoining properties, between the hours of 9 am and 3 pm on 21 June.

TABLE B: DETACHED SINGLE STOREY DWELLINGS-in a Heritage Conservation Area

DESIGN ELEMENT-BULK AND SCALE

• No increase in overshadowing to principal area of ground level private open space or habitable rooms of any adjoining properties, between the hours of 9 am and 3 pm on 21 June.

TABLE C ATTACHED DWELLINGS AND APARTMENT BUILDINGS-not in Heritage Conservation Areas

DESIGN ELEMENT-BULK AND SCALE

• No increase in overshadowing to principal area of ground level private open space or habitable rooms of any adjoining properties, between the hours of 9 am and 3 pm on 21 June."[30]

3.2.14 The date of 21 June is the most appropriate date to specify in LEPs as this is the date of the winter solstice when overshadowing from neighbouring buildings is at its greatest. This is preferable to the Sydney LEP, reg 49, which refers to overshadowing between 14 April and 31 August in any year. While the majority of LEPs provide protection between 9am and 3pm Eastern Standard Time, the Inverell LEP 1988, reg 21 extends protection from 9am to 3.30pm, while the Sydney LEP 2005, reg 49 provides different times for different areas varying between 12 noon and 2pm to 10.30am to 4pm.

OVERSHADOWING OF A PERCENTAGE OF NEIGHBOURING LAND

3.2.15 A unique provision exists in the Sydney LEP 2005, reg 52, which seeks to regulate overshadowing on a percentage basis. The provision reads:

"**52 Height of buildings on a Category A or B site**

[30] See also Warringah LEP 2000, reg 62; Armidale LEP 1988, reg 17.

(1) Consent may be granted to development that will result in a building projecting above a sun access plane for a location if:

(a) the site of the building is a site nominated as Category A in Schedule 3, and

(b) the building would reduce the excess overshadowing of the location by at least 50 per cent between the nominated times specified for the location by clause 49. Excess overshadowing of a location is the area of shadow cast by so much of a building as projects above the sun access plane for the location."

HEIGHT AND SETBACK CONTROLS

3.2.16 Solar access can be protected by using height and setback controls to ensure that buildings do not unreasonably interfere with solar access on neighbouring properties. There are a number of illustrations of this approach in LEPs New South Wales. One example is the Blue Mountains LEP 2005, schedule 2:

"**SCHEDULE 2 – Locality management within Living Zones**

Part 1 - Living-General Zone

2 Building setback

(2) Setback from other boundaries

(a) The maximum width across an allotment of any building that has a street frontage is not to be greater than 80 per cent of the greatest width of the allotment at any one point.

(b) The minimum setback of a dwelling from the side or rear boundary of the allotment is 1 metre.

(c) Notwithstanding paragraph (b), the minimum setback from the side boundary does not apply to minor additions and alterations to a building where this:

(i) incorporates an extension of an existing external wall along the line projected by that wall, and

(ii) does not decrease the closest distance of the building to the side boundary.

(d) Notwithstanding paragraphs (b) and (c), the location of buildings on an allotment is to ensure that:

(i) the bulk and scale of development is consistent with the existing streetscape of the surrounding area and promotes a prominent landscape setting for dwellings, and

(ii) Overshadowing of adjoining buildings and impact on solar access to the living areas and private open space of those buildings is minimised,"[31]

BUILDING ENVELOPES

3.2.17 Building envelopes, which identify in three dimensions the land area and air-space of particular blocks of land which may be developed, are well-known amongst architects. The system of solar envelopes was advanced by Ralph Knowles in the 1970s.[32] Under this system it is possible to specify by use of building envelopes the land area and air-space of one block of land which can be built upon without significantly shading neighbouring land. It is possible to enact a system of solar access protection based on solar envelopes, which would specify the permissible envelopes in individual localities.

3.2.18 An approach of this nature has been adopted in a minority of LEPs in New South Wales. An illustration is the Penrith LEP 1998 (Urban Land), reg 12, which states:

"**12 Building envelopes, heights, landscaped areas and rear boundary setbacks for development that requires consent**

"(1) The objective of this clause is to prescribe building envelopes, external wall heights, landscaped areas and rear boundary setbacks which:

(a) achieve site-responsive development at a scale which is compatible with existing housing in the locality by controlling visual impacts relating to height and bulk, and

(b) minimise the impact of loss of privacy, overshadowing and loss of views,

……".[33]

[31] See also Gosford City Centre LEP 2007, reg 33A; Liverpool City Centre LEP 2007, reg 33G.

[32] R Knowles, "The Solar Envelope" (1980) 2 *Solar Law Reporter* 263.

[33] See also Blue Mountains LEP 2005, Schedule 1; Shoalhaven LEP 1985, reg 40K.

SPECIAL CONTROLS ON ADVERTISING SIGNS

3.2.19 Advertising signs are singled out for special mention in some LEPs to ensure that they do not cause overshadowing of neighbouring properties. The Tweed LEP 2000, reg 47 is a good illustration:

"**47 Advertising signs**

(1) Objective The objective of the advertising sign provisions is to ensure that outdoor advertising:

(b) does not adversely affect the locality in terms of appearance, size, illumination or overshadowing or in any other way, …".[34]

SPECIAL CONTROLS ON HERITAGE ITEMS

3.2.20Heritage buildings are also subject to special protection affecting overshadowing in some LEPs. For example, the Cobar LEP 2001, reg 25 reads:

"**25 Development in the vicinity of a heritage item**

(1) Before granting consent to development in the vicinity of a heritage item, including work:

(a) which may affect its setting, such as by obscuring a significant view to or from the heritage item or by overshadowing it, or…

(2) The consent authority may refuse to grant any such consent unless it has considered a heritage impact statement that will help it assess the impact of the proposed development on the heritage significance, visual curtilage and setting of the heritage item.

(3) The heritage impact statement should include details of the size, shape and scale of, setbacks for, and the materials to be used in, any proposed buildings or works and details of any modification that would reduce the impact of the proposed development on the significance of the heritage item."

[34] See also Richmond River LEP 1992, reg 40; Rockdale LEP 2000, reg 22; Byron LEP 1988, reg 64; Pittwater LEP 1993, reg 48.

SPECIAL CONTROLS ON ARCHITECTURAL ROOF FEATURES

3.2.21 Architectural roof features that cause a building to exceed specified developmental height limits are also singled out in some LEPs for special mention because of overshadowing concerns. One such provision is that of the Penrith LEP 1998 (Urban Land), reg 12:

> "**22 Architectural roof features**
>
> (1) A person may, with development consent, carry out development that includes an architectural roof feature that exceeds, or causes a building to exceed, the height limits set by clause 21.
>
> (2) Development consent must not be granted to any such development unless the consent authority is satisfied that:
>
> (iv) will have minimal overshadowing impact,….".[35]

3.3 SOUTH AUSTRALIA

3.3.1 The Development Act 1993 and the Development Regulations 2008 provide the statutory framework for the South Australian planning and development system. The legislation provides for the creation of development plans at the local government level for determining development applications. The plans contain "objectives" and "principles of development control", which determine the assessment of all applications for development. By section 33(1) of the Act, the relevant authority is required to take into account the various stated objectives and principles of development control to the extent to which they are relevant, including the relevant Development Plan. By section 23(3), the Development Plan may contain provisions relating to "the natural or constructed environment and ecologically sustainable development". This is clearly sufficiently broad to include solar access.

3.3.2 There are 68 Development Plans in South Australia, and their terms are by no means uniform in relation to solar access protection. Only a comparatively few contain principles of development control that specifically refer to the need for developments to be designed and oriented so as to maximise solar access for solar PV or hot water systems . A larger number of Plans contain provisions that are aimed at preserving sunlight in private open spaces rather than with the energy-generating potential of sunlight. Others do not mention solar access specifically, but deal

[35] See also Parramatta City Centre LEP 2007, reg 21A; Goulburn Mulwaree LEP 2009, reg 5.6; Sydney LEP 2005, reg 51.

with the issue indirectly by prescribing minimum set-back distances of developments from property boundaries and/or by limiting the height of developments.

3.3.3 Six different types of solar access protection provisions can be identified in the South Australian development plans.[36] These are as follows:

(I) ACCESS TO SUNLIGHT BETWEEN CERTAIN HOURS OF THE DAY

3.3.4 One illustration is the City of Adelaide Development Plan (Consolidated 30 August 2007), Principle of Development Control 25:

> "Within Residential Zones of the North Adelaide Historic (Conservation) Zone, sunlight to solar panels should be maintained for a minimum of two consecutive hours between 9.00am and 3.00pm solar time on June 22 provided that it does not restrict the reasonable development of adjoining sites".[37]

The term "reasonable development of adjoining sites" is clearly an imprecise term the meaning of which has not yet been judicially determined.[38]

(II) OVERSHADOWING AS AN AMENITY OF THE SURROUNDING AREA

3.3.5 For example, the City of Burnside Development Plan (Consolidated 13 December 2007), Amenity, Objective 15 states:

> "The amenities of localities [should] not be impaired by the appearance of land, buildings and objects by noise, light, emissions, traffic, overlooking, overshadowing or any other quality of factor".[39]

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[36] This is the informal classification used by J Shepherd in a LLB Honours thesis "…" at the University of Adelaide, June 2008. These different types of provisions were first identified in New South Wales by Goudkamp, note xxx above.

[37] See also City of Mount Gambier Development Plan (Consolidated 16 October 2008), Conditions Applying to Complying Developments (Table MtG©1), for single storey detached dwellings, condition 8.

[38] The issue was raised in *Leimal Pty Ltd t/as Boots & Partners v Adelaide City Council* [2004] SAERDC 61.

[39] See also City of Charles Sturt Development Plan (Consolidated 4 September 2008), Council Wide, Principle of Development Control 97; City of Salisbury Development Plan (Consolidated 11 September 2008), Neighbourhood Centre

This type of provision is only one of a number of factors that the planning authority must consider when determining whether to approve a provisional development plan, and there is no direction as to the weight to be given to solar access.

(III) PRESERVATION OF SUNLIGHT AS A DEVELOPMENT OBJECTIVE

3.3.6 The City of Burnside Development Plan, Residential Development, Principle of Development 163(e) states:

"Development in a centre zone should be designed and located to minimise impact on existing or potential dwellings in an adjacent zone due to:

(e) loss of privacy or overshadowing".[40]

As with category (ii) above, the preservation of sunlight is only one of a number of relevant factors for the consideration of the planning authority.

(IV) LIMITING OVERSHADOWING – GENERAL STATEMENTS

3.3.7 A number of development plans include statements of a general nature in support of solar access. The exact terms and scope of such statements vary significantly from one plan to another. One illustration is the City of Adelaide Development Plan (Consolidated 30 August 2007), Council Wide, Principle of Development Control 117 states:

"Development should be sited and designed to minimise impact on solar access on adjoining land or buildings".

Zone, Principle of Development 3; City of Mitcham Development Plan (Consolidated 18 September 2008), Residential Development, Principle of Development 19.

[40] See also City of Marion (Consolidated 11 December 2008), Regional Centre Zone, Principle of Development 15; City of Mitcham Development Plan (Consolidated 18 September 2008), Residential (Blackwood) Urban Zone, Principle of Development Control 4; City of Charles Sturt Development Plan (Consolidated 4 September 2008), Principle of Development Control 226.

Another illustration of this type of provision, albeit with a different emphasis and content, is the City of Salisbury Development Plan (Consolidated 11 December 2008), Council Wide, Principle of Development 9:

"Development should …. ensure that the privacy and access of sunlight to adjoining areas is maintained".[41]

(V) LIMITS ON BUILDING HEIGHT TO PREVENT OVERSHADOWING

3.3.8 This is a commonly found type of provision in Development Plans in South Australia. For example, the City of Burnside Development Plan (13 December 2007), Residential Development, Principle of Development Control 120 states:

"The outer walls of building should be of a height and length and located in relation to the boundaries of its site so that:

(a) they do not cause a significant loss of amenity in terms of visual impact, overshadowing effect or access to daylight".[42]

(VI) ENCOURAGEMENT OF SOLAR ENERGY AND NEED TO PROTECT EXISTING SOLAR COLLECTORS

3.3.9 This type of provision is the most relevant and effective of the different categories of solar protection discussed above for ensuring that solar access is protected in new proposed residential or commercial building developments. For example, the City of Burnside Development Plan (13 December 2007) Residential Development Objective 34 states in part:

[41] See also City of Mitcham Development Plan (Consolidated 18 September 2008), Residential (Craigburn) Zone, Principle of Development Control 22.

[42] See also City of Victor Harbor Development Plan (Consolidated 20 March 2008), Building Siting, Principle of Development Control 65(b)-(c); Barossa Council Development Plan (Consolidated 26 March 2009), Townships, Principle of Development Control 154(b)-(c); City of Charles Sturt Development Plan (Consolidated 4 September 2008), Charles Sturt (City) District Centre (Hindmarsh) Zone, Principle of Development Control 7; City of Mitcham Development Plan (Consolidated 18 September 2008), Principle of Development Control 26(a)(iii)-(iv).

"Residential development which moderates adverse climatic considerations, takes advantage of solar energy, does not unreasonably overshadow adjacent development and protects the natural environment.

Energy requirements for air and water heating and cooling and other purposes can be met by a combination of passive or active solar systems… Sunlight access not only benefits amenity but also is necessary to enable efficient use of solar energy collection systems. Such systems are affected by buildings and allotment orientation by shadowing from buildings and trees, and accordingly, it is desirable to protect existing collectors and recognize potential for use on sites adjacent to a development site".[43]

THE ROLE OF THE COURTS IN INTERPRETING AND APPLYING SOLAR ACCESS LEGISLATION

4.1 As we have seen in the last section, under the types of planning and development legal regimes currently in place in Australia, a considerable discretion is given to the relevant authorities as to whether to take solar access into account when determining development applications. In all jurisdictions a right of appeal to the courts exists against this administrative decision. The role of the courts in applying the law is thus important.

4.2 Comparatively few cases have been reported on the issue of solar access for PV or water heaters. Most cases have concerned the issue of overshadowing for amenity purposes. The cases that have been reported have been generally unfavourable for the issue of solar access protection. It is not always clear from the cases whether the adverse decisions are the result of an unsympathetic attitude shown by the judges to solar access or whether it is simply the result of the courts applying the normal rule of administrative law appeals that they will not substitute their views for that of the administrative decision-taker but will only intervene where the administrative decision-taker has breached one or more of the rules of administrative law.

4.3 The most recent case on the issue is *Teoh v Hunters Hill Council*, a decision of the New South Wales Land and Environment Court.[44] In this case, a neighbour was granted consent to build a second storey to his house. Mrs Teoh, the applicant, contested the approval on the ground that the council had allegedly misapplied the solar access control set out in s 7.4 of the Development Control Plan (DCP) No 15. The major objection of the applicant was in relation to the impact of the

[43] See also City of Charles Sturt Development Plan (Consolidated 4 September 2008) Residential Objective 33; City of Salisbury Development Plan (Consolidated 11 December 2008), Residential Development Objective 2; City of Mitcham Development Plan (Consolidated 18 September 2008), Council Wide Objective 9.

[44] [2008] NSWLEC 263.

neighbouring development on solar access to her home. Specifically, the applicant sought a declaration that the consent was void on the following grounds:

- The Council found that the proposed development complied with the solar access requirements of DCP 15 without any evidence to justify that finding;
- The finding that the proposed development complied with the solar access requirements of DCP 15 was so unreasonable that no decision-maker could have so found;
- The Council misdirected itself as to the interpretation of the solar access requirements of DCP 15; and
- The Council failed to properly consider the solar access requirements of DCP 15.

4.4 The court decided in favour of the respondent. Sheahan J noted that while there is no doubt that the development would increase the shadow effect, the Council had considered that impact and it was not for the court to review the consent on its merits; rather, the court's function is to review the process followed by the Council to ensure that it carried out its obligations according to the law. The court concluded that the evidence was indicative of the conclusion that the Council's consideration was thorough and fair in every respect. While the applicant might well be disappointed by the Council's decision, there was no reviewable error.

4.5 *Lewis v City of Subiaco*[45] is a decision of the Western Australian State Administrative Tribunal. This case involved an application for review of the City of Subiaco's refusal of a development application for a new two-storey dwelling. One of the objections to the development was overshadowing of neighbouring property. The Tribunal observed that some overshadowing of the neighbouring lot was almost inevitable because of the orientation and narrow width of the subject site, and that the overshadowing would be especially noticeable towards the rear of the lot where any two-storey sections would be logically located as a result of the council policy requirements on streetscape. The Tribunal concluded that the overshadowing was acceptable. It added that the outcome had been achieved by careful design of the architect, who had located the building in such a way so as to minimise the shadow as much as possible. While the proposed building breached the Streetscape Policy, the Tribunal declared itself satisfied that the increased height and associated overshadowing would not result in an undue adverse impact on the adjoining residential site.

4.6 A case that focuses directly on solar access for solar energy devices is *Bowden v Greater Geelong City Council*.[46] This case concerned the proposed construction of a two-storey dwelling. The major issue in contention was the overshadowing of solar panels located on top of the carport roof. The evidence showed that at about 3pm, the proposed dwelling would cast shadows over about 25 per cent of the panel area. There would be no shadow before midday with shadows at 1pm and 2pm being less than at 3pm. This did not take account of the shadow impact of existing vegetation near the boundary, some of which was reasonably dense even in mid-winter. The issue

[45] [2007] WASAT 237.

[46] [2007] VCAT 1334.

was whether the extent of the overshadowing was reasonable in the circumstances. The Tribunal decided this matter in the affirmative. The Tribunal stated:

> "In this case, the solar panels have been installed in a convenient place; that is, on the carport roof. However, the carport is located in a position that is vulnerable or susceptible to the impacts of development on neighbouring land. While efforts to embrace and effectively utilise alternative and environmentally friendly energy services deserve strong support, it is also important that the infrastructure be installed in a way that does not unreasonably prejudice the use and development of nearby land in a way that is supported by policy and the purpose of the [development] zone. In this case, the solar panels are positioned near the common boundary of a small vacant lot. The decision to place these panels adjacent to the side boundary makes them vulnerable to the impacts of development on adjoining land. In the circumstances, I do not consider it reasonable to reject the proposal on the ground that the solar panels are overshadowed because of where they are positioned and that they have been placed on a relatively low structure. I would have a different view if the panels were located more centrally and elevated on the [solar user's] property".

4.7 The final case of note is *Ryan v Moreland City Council*.[47] The proceedings in this case related to the development of a two-storey swelling extension. The neighbour objected on the grounds of loss of sunlight and that the energy efficiency of the household would be diminished. These arguments were ultimately rejected by the Tribunal, which stated that it was unreasonable to expect that the proposed development site would remain in its current state and that the dwelling clearly needed to be renovated and brought into today's living standards. Subject to minor changes, the council's consent to the proposed extension was upheld despite the Tribunal finding that there would be a significant loss of sunlight and a reduction in energy efficiency.

4.8 These cases show that there appears to be an unsympathetic approach by the courts and tribunals to the safeguarding of a solar user's property from overshadowing in the sense that the issue of overshadowing seems to be regarded as of only minor planning and development significance in comparison with the other relevant considerations listed in the various development plans. One of the earlier cases in this area was *Surrowee Pty Ltd v T K Property Group*,[48] where the Victorian Civil and Administrative Tribunal held that solar access for solar collectors is less important than other policy objectives such as urban consolidation. There appears to have been no discernible change in attitude.

[47] [2005] VCAT 1361.

[48] [2002] VCAT 1.

OVERSEAS LEGISLATION

5.1 Amongst common law jurisdictions, the majority of legislative developments to protect solar access has emanated in the United States. As in Australia, under the United States Constitution there is no formal role for federal legislative intervention in this area, and legislative power vests in the States. A significant number of States (and some municipalities) have taken significant action to protect solar access – in particular, California, New Mexico, Wyoming and Colorado. The methods of legal protection differ from State to State, and a variety of different forms of legislation have been adopted. These have variously adopted legislative reforms based on property law, planning law and nuisance. The most significant of these measures will now be discussed.

5.2 LEGISLATION ON PUBLIC NUISANCE

5.2.1 A number of States have enacted a legislative declaration that it is in the public interest that solar energy appliances should be encouraged. For example, section 801.5 of the Californian Civil Code states in part:

> "(2) The legislature hereby finds and declares that:
>
> (a) Solar energy is a renewable, non-polluting energy source.
>
> (b) The use of solar energy systems will reduce the state's dependence on non-renewable fossil fuels, supplement existing energy sources, and decrease the air and water pollution which results from the use of conventional energy sources. It is, therefore, the policy of the state to encourage the use of solar energy systems....
>
> (c) The purpose of this Act is to promote and encourage the widespread use of solar energy systems and to protect and facilitate adequate access to the sunlight which is necessary to operate solar energy systems".

It is submitted that a provision of this nature would be unlikely to have any effect in the context of civil actions for nuisance. While the courts might possibly be prepared to accept that there is a public interest involved in the furtherance of solar energy technology, such a legislative declaration would be likely to be regarded by the courts as too vague to justify overturning established precedents on the law of public nuisance.

5.2.2 The Californian Solar Shade Control Act of 1978 adopts the nuisance approach more directly. This legislation provides, in section 25982, that no person owning or controlling property shall allow a tree or shrub to be placed or to grow on such property so as to cast a shadow covering more than

10 per cent of the collector absorption area of a solar collector on the property of another between 10am and 2pm local standard time. The location of the solar collector is required to comply with the local building and setback requirements, and to be set back not less than five feet from the property line and no less than ten feet above the ground. A collector may be less than ten feet in height, only if in addition to the five feet setback, the collector is set back three times the amount lowered. An exception is made for trees that at the time of the installation of the solar collector already cast a shadow upon that solar collector. Violation of this provision is deemed to be a public nuisance punishable by a specified fine (s 25983).

5.2.3 The obvious weakness with the Solar Shade Control Act is that it only applies to trees and shrubs, and does not apply where the obstruction to solar access is caused by buildings constructed on neighbouring land. A further limitation is that the Act does not protect potential sites for solar collectors, but only protects solar collectors once they have been legally constructed. In addition, the extent to which the neighbour's use and enjoyment of his or her property is subject to the location chosen by the solar user for the solar collector panels. There is no requirement that the solar user locate the panels so as to minimise problems of shading caused by potential obstructions on neighbouring land. The nearer to the boundary fence the solar user constructs his or her collector panels, the greater is the burden on the neighbouring land. Finally, the height and setback requirements can be criticised in that they do not recognise the extent to which the local topography affects the shading caused by buildings or trees. The length of shadows on a solar user's land caused by trees or buildings on neighbouring property will vary significantly if the terrain is undulating. In some circumstances an undulating terrain will exacerbate the problems caused by shading, and in other circumstances it will reduce it. The Californian legislation applies one inflexible rule to all locations, regardless of whether the terrain is flat or undulating.

5.3 LEGISLATION ON PRIVATE NUISANCE

5.3.1 There is no comprehensive legislation in any common law jurisdiction which alters the common law on private nuisance in order to provide a remedy for a solar user against shading of solar collector panels. However, in Minnesota the Minnesota Energy Agency issued a report designed as a comprehensive legislative proposal dealing with the legal, institutional and financial issues surrounding solar energy in that State. In relation to solar access, the Agency specifically recommended that a violation of its solar access protection laws should be declared to be a private nuisance.[49] The Agency alluded to the possibility of enacting legislation along the lines of the Californian Solar Shade Control Act, but stated its preference for legislation affecting private nuisance on the ground that some legal authorities will argue that the shade does not damage the public but only the owner of the solar energy system actually harmed. This recommendation was not acted upon by the legislature.

[49] Minnesota Energy Agency, *Legislative Options for Encouraging Solar Energy use in Minnesota* (1977).

5.4 THE RIGHT OF SOLAR ACCESS AS A SEPARATE, NOVEL INTEREST IN PROPERTY

5.4.1 A further alternative method of protecting solar access is to establish by legislation a solar access right as a separate, novel interest in property. This form of legislation has been enacted in New Mexico and Wyoming. The legislation in both these States declares that the right to use solar energy is a property right and provides that principles developed in the western United States governing water law shall be applied to define the solar right.

5.4.2 Section 47-3-4 of the New Mexico Solar Rights Act reads as follows:

> "A. The legislature declares that the right to use the natural resource of solar energy is a property right, the exercise of which is to be encouraged and regulated by the laws of this state. Such property right shall be known as a solar right.
>
> B. The following concepts shall be applicable to the regulation of disputes over the use of solar energy where applicable:
>
> (1) "beneficial use". Beneficial use shall be the basis, the measure and the limit of the solar right, except as otherwise provided by written contract. If the amount of solar energy which a solar collector suer can beneficially use varies with the season of the year, then the extent of the solar right shall vary likewise;
>
> (2) "prior appropriation". In disputes involving solar rights, priority in time shall have the better right except that the state and its political subdivisions may legislate, or ordain that a solar collector user has a solar right even though a structure or building located on neighbouring property blocks the sunshine from the proposed collector site....; and
>
> (3) "transferability". Solar rights shall be freely transferable within the bounds of such regulation as the legislature may impose. The transfer of a solar right shall be recorded.....".

5.4.3 The principles borrowed from water law are those of beneficial use and prior appropriation. Under the New Mexican legislation, a solar user who uses sunlight to collect solar energy (a beneficial use) is able to protect his property right in the sunlight by preventing any development from occurring on neighbouring land unless he or she is compensated under the "transferability" clause by the purchase of his right.

5.4.4 There are numerous difficulties associated with the suggestion that solar access should be created as a separate, novel interest in property, adopting water law concepts. Although at first glance there are certain similarities between solar access and water law, there are conceptual and practical difficulties involved in applying water law principles to solar access protection. The major difficulty is the fact that a person's right of unobstructed solar access interferes with the development of neighbouring land to a much greater extent than a person's right to appropriate water. Under the New Mexican legislation, the installation of a small solar hot water system could

by itself prevent significant development from occurring on neighbouring land. In this way the proper development of urban areas can be impeded. A further difficulty is that the adoption of a principle of beneficial use would cause great practical difficulties in the solar context. For example, what percentage of a solar user's energy consumption must be supplied by a solar device before there could be said to be a "beneficial use"? How would a court assess the issue of beneficial use if the solar device were shown to be inefficient or uneconomic? Even if a legislative definition of "beneficial use" were attempted, it would be impossible to devise a system which supplied much certainty into the law. Inevitably the issue would have to be left to judicial discretion, subject to certain legislative guidelines. Thus litigation would be needed before a solar user could be confident that his or her right of solar access would be protected. This would deter many potential solar users.

5.5 SOLAR ACCESS PERMITS AND REGISTRATION

5.5.1 Some States in the United States have legislated to permit the establishment of a system of solar access permits and registration at the local government level. Under such a system, solar access is protected on a lot by lot basis. Under such a system, a solar user seeking to safeguard solar access would apply to the local council for a permit. The solar user would be required to notify all neighbours whose property may be affected by the grant of a permit. The neighbours would be given a right to lodge an objection if they felt that the effect of granting the permit would be to deprive them of the right to develop their properties to a significant degree. In the event of an objection, a hearing of the issue would take place before the local council. The council would have the power to grant the permit with or without conditions or to refuse the permit. In appropriate cases the permit could be granted subject to the payment of compensation. A right of appeal would be allowed to the relevant State planning appeals tribunal. A permit, once granted, would be registered in a separate register of solar access permits, in which case no future building permits would be granted where the effect of the proposed construction would be to obstruct the permit holder's right of solar access.

5.5.2 One illustration is the City of Claremont, California. Its solar recordation ordinance covers cases where solar devices are added to existing residential buildings within the city. A landowner applying for a building permit to install a solar device must submit a lot plan showing the location of the proposed device in relation to surrounding structures and vegetation, both on the property owner's lot and on adjacent lots. The location of the device is reviewed and is either approved or is required to be relocated to a position that does not restrict neighbouring property owners as much as the first location. Once the building permit is granted and the collector location is recorded on the City Solar Access Map, future building permits will not be granted to neighbours if the proposed construction will obstruct the installed collector's solar access.

5.5.3 The major disadvantage of this system of solar access protection is that it involves the creation of a new bureaucracy to administer, and is therefore costly and time-consuming. A further problem is that it would vest a substantial area of discretion in the relevant department of the local

council, and in many cases it would be difficult to predict in advance of the hearing the likely outcome of the dispute. This in turn would tend to discourage neighbours from reaching a compromise settlement and would lead to protracted hearings. Finally, this system can be attacked as dealing with a community-wide planning problem on a piecemeal *ad hoc* basis.

5.6 SOLAR ENVELOPES

5.6.1 While a minority of LEPs in New South Wales contain a provision for avoiding overshadowing of neighbouring properties by the use of building envelopes, a more advanced and detailed use of envelopes is used in some parts of the United States. A state-wide system of solar envelopes has been enacted into law in Wisconsin by the Solar Access Act of 1981.[50] This legislation permits a solar user to rely for shade protection on the zoning restrictions imposed on neighbouring land applicable at the time that the solar device was installed. The Act creates a "building envelope", which is created by specified height, frontyard and backyard building restrictions defining a three-dimensional area of space that can be developed. Damages may be awarded to a solar user whose solar device is shaded by any structure built on neighbouring land outside the designated building envelope. A slightly different system also operates in the City of San Diego, California. The San Diego County Code of Regulatory Ordinances, s 81.401(m) states that all blocks of land subject to sub-division must have:

> "unobstructed access to sunlight to an area of not less than 100 square feet, falling in a horizontal plane 10 feet above the grade of the buildable area of the lot. The condition of unobstructed solar access shall be considered to be achieved when a specific area of not less than 100 square feet has been unobstructed skyview of the sun between azimuths of the sun at 45 degrees to the east and 45 degrees to the west of true south on December 21".

5.6.2 The basic problem with using the system of solar envelopes in a legal context is the complexity of the architectural concepts involved. The relevant envelope for each block of land can be unique and may require the services of an architect for its calculation. The effect of this is that any planning scheme incorporating the solar envelope concept would be complex and would be likely to be unintelligible to the average person. It is submitted that any system of solar access protection should be as simple as possible and should be easy to understand.

[50] Wisconsin Statute Annotated, s 700.41.

5.7 HYPOTHETICAL SOLAR FENCES

5.7.1 A more satisfactory alternative is the enactment of a system of hypothetical solar fences. This system produces the same result as solar envelopes but by a manner that is more easily reduced to legislation and is more intelligible. In essence, under the hypothetical solar fence system, no building or tree may be erected or planted on one block of land where the effect will be to cast a shadow on neighbouring land longer than the shadow cast by an imaginary fence of a designated height on the property boundary line between specified hours (say 9am and 3pm) on 21 June (the shortest day of the year).

5.7.2 This system enables any landowner wishing to develop his or her land to calculate without difficulty the extent to which he or she can legitimately shade his neighbour's property without possible complaint. The system also provides a form of legal protection of solar access for each block of land and enables a solar user to calculate which areas of his property will be shade-protected and will thus be suitable for locating solar collector panels. The amount of shade protection will depend in every case of the height specified in the planning scheme or legislation for the hypothetical solar fence. If the height of the fence is low (say three metres) a land developer may only shade a very limited area of his neighbour's property and the bulk of the neighbouring land will be shade protected. If the height of the fence is higher (say six metres) a land developer may shade a much larger area of his neighbour's property, and the extent to which the neighbouring land is shade protected will be much reduced. In general, the lower the height of the fence, the more stringent is the nature of the shade protection.

5.7.3 A useful precedent is the City of Boulder, Colorado. The Boulder Revised Code, s 9-9-17 divides the city is divided into three areas for solar access purposes. Area 1, which is the outer suburban area, is characterised by large blocks and low development. In this area, the city council specified the height of the hypothetical fence as 12 feet, which means that only limited shading is permissible and therefore that solar access is stringently safeguarded. Area 2, the inner suburban area, is characterised by two-storey buildings on smaller blocks of land. In this area, the height of the hypothetical fence is 25 feet, which is less restrictive of development on neighbouring land. Area 3 is the inner city core characterised by high-rise development. Here the council toyed for some time with the idea of establishing a much higher hypothetical fence, but eventually abandoned this idea in favour of a system of solar access protection by individual application to the council. Where this occurs, the council exercises a general discretion in the matter.[51]

5.7.4 The system thus has the advantage of flexibility and is easy to comprehend. In addition, it is comparatively straightforward to calculate mathematically the lengths of shadows cast by a fence on 21 June; actual observation of the shadows cast by the sun on that day is not required. There are two significant disadvantages to the system. First, it is unlikely to operate fairly or effectively in hilly or mountainous areas due to the greater shadow lengths of nearby buildings and trees on south-

[51] See L Danielson, "Drafting a Solar Access Ordinance: One City's Experience" (1982) 3 *Solar Law Reporter* 911.

facing slopes and the shorter shadow lengths of such erections on north-facing slopes. The disparity on shadow lengths is particularly acute in winter months when the sun is at a low altitude in the sky. Secondly, it cannot operate effectively in dense, high-rise inner city areas as the hypothetical fence would have to be set so high that the whole of the neighbouring blocks to the east and west would be in shadow.

CONCLUSIONS AND RECOMMENDATIONS

6.1 Despite the fact that the need to establish a satisfactory legal regime for solar access protection was recognised over thirty years ago, the analysis above shows that the law on this issue is still unsatisfactory. There is considerable scope for legal reform.

The issues to be considered are as follows:

- Do we wish to facilitate the use of common law methods of protecting easements, such as easements, restrictive covenants and nuisance?
- If we wish to continue with the current development and planning law control approach to solar access protection, what constitutes best practice in the field?
- Should we adopt any of the different approaches to the issue in the United States by considering more comprehensive controls?

COMMON LAW METHODS

6.2 In relation to the common law methods, while easements and restrictive covenants can never provide a universal system of solar access protection as they are a consensual transaction, it is suggested that solar users should be encouraged to safeguard their right to solar access by entering into an easement or restrictive covenant with their neighbour where this is practicable. In light of the lingering uncertainty as to whether a right of solar access to solar collector panels is recognised at common law, it is suggested that consideration should be given by the State legislatures to the enactment of a new section in existing property statutes clarifying the law by declaring the right of solar access to be capable of existing as a separate easement. Such an enactment was made in Colorado in 1975[52] and has been adopted since in the majority of the other States of the United States.[53]

[52] Colorado Rev Stat 38.32.5-101 to 102.

[53] See, for example, Alaska Stats, s 34.15.145; California Civil Code, s 801.5; Florida Stat Ann, s. 704.07; Georgia Code Ann, ss 85-1411 to 1414; Idaho Code, s 55-615; Illinois Ann Stat, ch 96.5, s 7303(f); Iowa Code, ss 93.22-25; Minnesota Stat Ann, s 500.30; Montana Rev Codes Ann, ss 70-17-301 to 302; Nebraska Rev Stat, ss 66-901 to 914; New Jersey Stat Ann, ss 46:3-24 to 3.26; Ohio Rev Code, s 5301.63; Virginia Code, ss 55-352-354; Washington Rev Code Ann, ss 64.04.140-170.

6.3 There appears to be no need to take the restrictive covenant approach to solar access protection further as this is merely a second, overlapping type of consensual protection of solar access.

6.4 In relation to private nuisance, this would appear to be an inappropriate form of solar access protection, relying as it does on individual litigation to secure any solar access safeguards. This can be argued to be an expensive and cumbersome procedure both for the solar user and the State, which assumes the cost of the court structure.

THE PLANNING AND DEVELOPMENT LAW APPROACH TO SOLAR ACCESS PROTECTION

6.5 In light of the inadequacies of the common law forms of protection of solar access, unless more radical forms of law reform are adopted as in the United States (see paras 6.6ff below), it is submitted that the planning and development law approach represents the best practice in the field. The planning and development approach to solar access protection represents the established system in this country. It enables local factors to be taken into account in the decision making process and is appropriate for all relevant factors to be considered in the planning process. The main challenge is to ensure that the various development plans include an appropriately worded clause or clauses concerning solar access protection. It is here that the current system is weak since, as shown above, there is no similarity of approach between the local authorities in the drafting of the local planning instruments. There is confusion in many current plans about the use of solar access for energy-generating purposes and for preserving the amenity of sunlight and other ambiguities and gaps in the drafting which collectively render the solar access provisions less effective as a form of protecting investments in solar water heaters and PV systems.

6.6 To ensure the most effective form of solar access protection as part of the current State planning and development legislation, it is submitted that each local authority should adopt the relevant clause contained in either the Warringah LEP 2000, reg 68 (para 3.2.10 above) or that contained in the City of Adelaide Development Plan, Principle of Development Control 25 (para 3.3.4 above). These clauses should be modified to ensure that solar access is protected for a minimum of (say) six hours per day between 9 a.m. and 3 p.m. local time (10 a.m. and 4 p.m. during summer time) on the shortest day of the year (June 21) on north-facing surfaces or the next most appropriate area for a PV system. The exact wording to be adopted in each case will need to vary to take account of the context and surrounding wording of the planning instrument.[Better than common law – established system – needs improving by monitoring the forms of solar access controls adopted by individual municipalities more closely]

MORE COMPREHENSIVE CONTROLS AS IN THE UNITED STATES?

6.6 In addition to the improvements in the current system of planning and development controls, it is submitted that municipalities should be empowered by State legislation to adopt a more comprehensive system of solar access controls, if they so wish. In this regard, it is submitted that the most effective and practicable of all the various forms of solar protection adopted in the United States, discussed above, is that of the hypothetical solar fence, as adopted in the City of Boulder, Colorado, and elsewhere. This involves establishing a system of zoning for solar access purposes and for differentiating between different areas of urban areas in terms of the level of solar access protection provided in each area. While this may appear to be discriminatory, it is essential as it is impossible to achieve the same degree of protection in dense inner-city areas as is achievable in more outlying, less densely populated areas. This form of protection could best be adopted in newly-constructed urban areas, where it would form an important part of urban development considerations, but can also be imposed (albeit less effectively) in established city and suburban areas.

6.7 As explained earlier, the system of hypothetical fences works less effectively in hilly areas than flat areas due to the effect of slopes on shadow lengths. It would also be difficult to impose the system in heavily treed localities (such as the Dandenong Ranges or the Adelaide Hills), where there are council policies in favour of retaining the amenity of the treed environment. It is for this reason that each municipality must be given the ultimate discretion as to whether to adopt such a system of solar access protection. However, in favourable terrain the system appears to represent the best legal approach to balancing the rights of neighbours to develop their land and the rights of solar user to solar access protection.

6.8 The overall conclusion and recommendation is thus:

1. Solar users should be encouraged to make legally binding easements with their neighbours, where possible. The legal efficacy of such easements should be recognised by an amendment to existing State property legislation.
2. The existing system of solar access protection under planning and development legislation should be continued, subject to the reforms noted earlier.
3. Municipalities should be authorised by State and Territory legislation to establish a system of zoning for solar access purposes and to adopt a system of hypothetical solar fences, as in the City of Boulder, Colorado.

APPENDIX 5: THE UK PLANNING CONTEXT

The enactment of three key pieces of legislation in late 2008 sets the current context for local planning and renewable energy projects in the UK. The relevant legislation is:

- The Climate Change Act 2008
- The Energy Act 2008
- The Planning Act

CLIMATE CHANGE ACT 2008

The Climate Change Act, billed as 'the world's first long term legally binding framework to tackle the dangers of climate change' aims to:

- improve carbon management and help the transition towards a low carbon economy in the UK; and
- demonstrate strong UK leadership internationally, signalling UK's commitment to taking its share of responsibility for reducing global emissions.

Key Provisions include:

- Legally binding targets: Greenhouse gas emission reductions through action in the UK and abroad of at least 80% by 2050, and reductions in CO2 emissions of at least 26% by 2020, against a 1990 baseline.
- A carbon budgeting system which caps emissions over five year periods, with three budgets set at a time, to set out the trajectory to 2050.
- The creation of the Committee on Climate Change, a new independent, expert body to advise Government on the level of carbon budgets and where cost effective savings could be made.
- A requirement for the Government to issue guidance next year on the way companies should report their greenhouse gas emissions, and to review the contribution reporting could make to emissions reductions by 1st December 2010. Requirement also that the Government must, by 6th April 2012, use powers under the Companies Act to mandate reporting, or explain to Parliament why it has not done so.
- New powers to support the creation of a Community Energy Savings Programme.

ENERGY ACT 2008

The Energy Act 2008 will implement the legislative aspects of the 2007 Energy White Paper: meeting the energy challenge, to deliver on four energy policy goals:

- to put UK on a path to cutting CO2 emissions by some 60% by about 2050, with real progress by 2020;

- to maintain the reliability of energy supplies;
- to promote competitive markets in the UK and beyond;
- to ensure that every home is adequately and affordably heated.

The Energy Act will update the legislative framework by putting in place new legislation to:

- Reflect the availability of new technologies (such as Carbon Capture & Storage (CCS) and emerging renewable technologies
- Correspond with changing requirements for security of supply infrastructure (such as offshore gas storage)
- Ensure adequate protections for the environment and the tax payer as the energy market changes

The Energy Act, alongside the Planning Act and Climate Change Act, will ensure UK legislation underpins the long term delivery of the energy and climate change strategy.

Key provisions include:

- Renewables: Strengthening the Renewables Obligation to drive greater and more rapid deployment of renewables in the UK. This will increase the diversity of the UK's electricity mix, thereby improving the reliability of our energy supplies and help lower the carbon emissions from the electricity sector
- Feed-in Tariffs: to enable the Government to introduce a tailor-made scheme to financially support low carbon generation of electricity in projects up to 5MW. The aim is that generators will receive a guaranteed payment for generating low carbon electricity

APPENDIX 6: THE MERTON RULE

Local planning policies (based on the Merton Rule) requiring new developments or refurbishments to include on-site renewables have also become increasingly important in encouraging PV as well as other small scale renewables.

The definition of what is referred to as the 'Merton Rule' is a borough wide prescriptive planning policy that requires new developments to generate at least 10% of their energy needs from on-site renewable energy equipment. The most commonly accepted threshold is 10 homes or 1,000m^2 of non-residential development - though this is sometimes lower. This is the accepted definition by local (and regional) planning authorities, academic institutions, trade and professional bodies, and the development, construction and engineering industries[54].

Significantly, the Merton Rule encompasses all buildings: houses, schools, supermarkets, shopping malls, office blocks, leisure centres, etc.

While the intent of the Merton Rule to create a valuable driver for local renewable energy developments using local authorities' planning powers is highly commendable and in several locations has directly and significantly stimulated the installed RE capacity base, it is nonetheless a voluntary measure and is prone to local variations in, for example, the strength of the enforcement of the measure. Some might "expect" a developer to enforce the 10% rule, some will "require" it [55].

A number of issues have been raised as to the practicality or indeed the sense of a broad-brush requirement for onsite renewable energy, including:

- The inflexibility as regards implementation of strong energy savings (demand-side) measures ahead of or alongside renewable energy supply.
- For new build projects, how to determine expectations of energy consumption, and hence dictate the energy contribution from RES.
- Frequently, the expectations as required to satisfy Building Regulations (including requirements under the European Directive on Energy Performance of Buildings) are based on the predictive modelling, such as Standard Assessment Procedure (SAP 2001/2005) for new residential buildings. In themselves these do provide reasonable indications of expected performance. However, when coupled to some poor 'sustainability reports' specifying measures that may be taken to realise the targets, implementation may be practically impossible.

[54] Merton Council, What is the Merton Rule?, http://www.merton.gov.uk

[55] Climate Change Corp, The truth about… the Merton rule, http://www.climatechangecorp.com/content.asp?ContentID=5932

Additionally budgetary, staffing and other resource constraints can make post-implementation monitoring and policing of the implementation of measures challenging, leaving the mechanism open to potential abuse by unscrupulous developers.

Nonetheless, the Merton Rule, and the enhanced 'Merton Plus' (requirement for 20% contribution from renewable energy sources towards building energy consumption), particularly when actively championed by local authorities such as Merton, Croydon and others, can be a strong positive driver for PV development.

The strength and clarity of local government leadership, coupled with the provision of accessible information and supporting resources or tools are fundamental factors in the ease or difficulty facing solar installers and solar system owners.

Merton Rule - Commitment Levels

Fully Adopted
Ashford, Bolton, Bromley, Camden, Cheshire, Croydon, Ealing, East Devon, Greenwich, Haringey, Havering, Horsham, Isles of Scilly, Knowsley, Lambeth, Leicester, Luton, Manchester, Merton, Milton Keynes, North Devon, Oldham, Plymouth, Preston, Richmond, Rugby, Sefton, South Holland, Southwark, Surrey, Tandridge, Vale Royal, Waltham Forest, Yorkshire and Humber

Included in draft LDF/SPD
Arun, Barking and Dagenham, Barnsley, Bedford, Blyth Valley, Bracknell Forest, Calderdale, Cambridge, Canterbury, Carrick, Chichester, Chorley, Darlington, Doncaster, East Cambridgeshire, East Staffordshire, Eastbourne, Fareham, Forest Heath, Gateshead, Gloucester, Guildford, Hambleton, Hillingdon, Huntingdonshire, Isle of Wight, Islington, Lewisham, Lichfield, Maidstone, Melton, Middlesbrough, North Cornwall, North East, North Norfolk, North Somerset, North Warwickshire, North West, Norwich, Portsmouth, Reading, Redbridge, Redcar and Cleveland, Rochdale, Ryedale, Sedgefield, Sheffield City Council, Solihull, South Bucks, South Cambridgeshire, South Norfolk, Southampton, Sutton, Tower Hamlets, Tunbridge Wells, Uttlesford, Wakefield, Warwick, Waverly, West Berkshire, Westminster, Woking, Wokingham, Wychavon, York

Actively Progressing
Aylesbury Vale, Bexley, Blackburn with Darwen, Bradford, Breckland, Brighton and Hove, Bristol City Council, Bury, Charnwood, Chelmsford, Corporation of London, Craven, Crawley, Dacorum, Dartford, Derby, East Northamptonshire, East Riding, Edinburgh, Enfiled, Exeter, Hammersmith and Fulham, Harlow, Harrogate, Harrow, Hart, Havant, Havering, Hull, Kirklees, Lancaster, Leeds, Liverpool, Mid Bedfordshire, N Tyneside, N Wiltshire, NE Lincolnshire, Newcastle under Lyme, Newham, North Hertfordshire, North Lincolnshire , Poole, Purbeck, rotherham, Runneymead, Salford, Scarborough, south Hams, South Somerset, St Albans, Stockport, Stockton on Tees, Surrey Heath, Telford and Wrekin, Tendring, Test Valley, Three Rivers, W Devon, Waveney, Wigan, Wolverhampton, Worcester City, Wycombe

Assessing Feasibility
Amber Valley, Belfast, Derwentside, Dudley, E Hampshire, Elmbridge, Malvern Hills, N Kesteven, New Forest, Penwith, Redditch, S Lakeland, South Gloucestershire,

CASE STUDY: LONDON BOROUGH OF CROYDON[56]

Croydon was one of the earliest councils in the UK to adopt the Merton Rule. The specific requirement is for residential developments of more than 10 units and non-residential developments of >1000m^2 to implement onsite renewable energy services to off-set at least 10% of predicted carbon emissions.

Implementation of the Merton Rule has resulted in some issues for project stakeholders which the council has sought to address:

- Impact of the renewable energy requirement on obtaining planning permission and subsequent delays

Council established the 'Croydon Energy Network's Green Energy Centre helpline to provide advice and support to identify appropriate renewable energy solutions for a particular development, as well as information on grants.

Planning applications must include an Environmental Performance Statement including the siting, size and location of renewable technologies. The council provides guidance to ensure that requirements are met in advance of planning permission.

- Added cost of installing on-site renewables

Croydon Borough Council has observed that the real obstacle appears to be largely know-how rather than cost, and is providing evidence to support the view that developments including environmentally sustainable measures will also add value to the property

- Barrier to affordable housing

This is not the experience of Croydon, which has seen an increase in the number of new homes completed since the Rule was introduced. At the same time, the borough has exceeded the London Mayor's target for 50% of all new homes to be affordable.

[56] Croydon case study FINAL, PV Upscale (www.pvupscale.org)

- Dislike of planning impositions

Council is working with developers to achieve the 10% requirement; many are 'surprised at how easy it is to achieve'. It may not be necessary to install a micro renewable system on every dwelling in order to achieve the estate's overall 10% target. Additionally some developers are reportedly now starting to see the PR benefits.

- Sub-optimal performance of renewable installations

Guidance is available to developers to ensure that the energy output is maximised. The London Renewables Toolkit provides guidance on renewable energy technologies and how to calculate the 10% figure, based on off-setting 10% carbon emissions above and beyond compliance with Building Regulations Part L.

- Appropriateness and cost-effectiveness of energy measures

Council is encouraging developers to implement energy efficient measures before renewable energy alternatives. Renewables must still justify their selection. The main barrier to further uptake of PV under the Merton Rule is cost.

Energy efficiency measures are generally more cost effective than renewables, and this has been an argument against the Merton Rule. However energy efficiency is covered within the Building Regulations, Part L, whereas renewables are now viewed as a planning issue.

- Restriction on renewables in some areas

Croydon Council has actively lobbied for permitted rights across all boroughs in England. This contributed to the introduction of Permitted Development Rights throughout England, as of 6th April 2008.

APPENDIX 7: RELEVANT RECCOMMENDATIONS FROM THE REPORT 'TAKING THE RED TAPE OUT OF GREEN POWER' BY NETWORK FOR NEW ENERGY CHOICES (NNEC)

RECOMMENDATION 1: REMOVE BARRIERS TO PV SYSTEMS FROM BUILDING AND ZONING CODES.

RECOMMENDATION 1-A: Exempt roof-top PV systems from building height limitations.

RECOMMENDATION 1-B: Allow "over-the-counter" building permits for standard roof-mounted PV systems that do not exceed the roof support capabilities of a structure meeting minimum building code requirements.

RECOMMENDATION 1-C: Do not restrict PV systems on aesthetic grounds.

RECOMMENDATION 2: SIMPLIFY PV PERMIT APPLICATION FORMS AND REVIEW PROCESSES.

RECOMMENDATION 2-A: Coordinate PV permitting procedures with nearby jurisdictions.

RECOMMENDATION 2-B: Base PV electrical permitting requirements on IEEE 1547 and UL 1741.

RECOMMENDATION 2-C: Provide training to educate building and electrical inspectors about PV technology and installations.

RECOMMENDATION 3: ADOPT FLAT PERMIT FEES OR FEE WAIVERS FOR PV AND SMALL WIND SYSTEMS.

RECOMMENDATION 6: EASE PERMITTING PROCESSES BY ESTABLISHING STATEWIDE INTERCONNECTION STANDARDS AND EDUCATING BUILDING AND ELECTRICAL INSPECTORS ABOUT PROPER INSTALLATION PROCEDURES FOR DISTRIBUTED RENEWABLE ENERGY SYSTEMS.

RECOMMENDATION 6-A: Establish statewide PV interconnection standards that use IEEE 1547, UL 1741, and the NEC.

RECOMMENDATION 6-B: Establish statewide training and education programs for building and electrical inspectors about distributed renewable energy systems.

RECOMMENDATION 7: ADOPT LEGISLATION AT THE STATE LEVEL MANDATING CONSISTENT AND APPROPRIATE PERMITTING REQUIREMENTS FOR DISTRIBUTED RENEWABLE ENERGY SYSTEMS.

RECOMMENDATION 7-A: Adopt legislation requiring local governments to establish time-efficient permitting processes and reasonable review criteria for distributed renewable energy.

RECOMMENDATION 7-B: Adopt "solar rights" legislation banning private covenant restrictions on distributed renewable energy systems.

RECOMMENDATION 7-C: Create enforcement procedures and penalties for non-compliance with solar rights laws and develop an education program to inform homeowners of their rights and community associations of their obligations under the law.

APPENDIX 8: LIST OF PEOPLE CONTACTED FOR THIS PROJECT

NSW

INTERVIEWS HELD

LOCAL GOVERNMENT

- City of Sydney: Anthony Smith (Team Leader - Urban Design and Heritage), Melinda Cook, Benjamin Pechey (Specialist Planner), Nik Midlam
- Woollahra: Chris Bluett (Manager Strategic Planning)
- Randwick: Lorraine Simpson (Heritage Consultant), Bronwyn Englaro (Senior Sustainability Manager)

SURVEYS COMPLETED

- City of Sydney – Luke Murtas, Planning Officer
- Woollahara Council – Chris Bluett, Manager Strategic Planning
- Randwick City Council – Lorraine Simpson, Heritage Consultant

STATE GOVERNMENT

- Jonathon Carle, Senior Planner, Policy & Systems Innovation, Department of Planning

PV INSTALLERS

INTERVIEWS HELD

- Beyond Building (NSW)
- Clear Security (NSW)
- LJW Solar (NSW)
- Rainbow Power Company (NSW)

OTHER

- Marsh Cashman Koolloos Architects
- Royal Australian Institute of Architects

SOUTH AUSTRALIA

LOCAL GOVERNMENT

INTERVIEWS HELD

- City of Onkaparinga: Maggie Hine Group Manager, Sustainability, Keith Laslett – Building Approvals, Ben Victory – Development Team Leader
- City of Campbelltown – Nigel Litchfield, Manager Development Assessment (by phone)
- City of Mitcham, Magnus Heinrich – Manager Development Assessment (by phone)

STATE GOVERNMENT

INTERVIEWS HELD

- Department of Planning and Local Government, Don Freeman, Manager Building Policy

PV INSTALLERS

INTERVIEWS HELD

- Solar Shop Australia, David Buetefuer
- Michelle Drummond (In personal capacity. Currently employed by Phoenix Solar, ex-EcoSouth and Solaris Pty Ltd)
- Solaris Pty Ltd: Sandy Pulsford, Proprietor
- Solar Wind Systems Pty Ltd: Ekkehard Groskreutz

SURVEYS COMPLETED

- EcoSouth – Chris Hart, Manager

OTHER

INTERVIEWS HELD

- TAFE SA – Aussie Kanck, Lecturer Renewable Energy

VICTORIA

LOCAL GOVERNMENT

INTERVIEWS HELD

- Ben Morris, Policy Adviser - Energy and Waste **Municipal Association of Victoria**
- Fionna Moon, Town Planner, **Wyndham City Council**, VIC
- Jill Berry, Climate Change Officer, Sustainability & Environment, **Maribyrnong City Council**, VIC
- Matthew Trigg, Sustainable Design Officer, **City of Port Phillip**, VIC and CASBE Coordinator Council Alliance for a Sustainable Built environment (CASBE). CASBE) is the body responsible for advocating and implementing the Sustainable Design Assessment in the Planning Process (SDAPP) programme, of which Moreland Sustainable Tools for Environmental Performance Strategy (STEPS), a residential building sustainability rating tool and Sustainability Design Scorecard (SDS)[57] for non-residential buildings play a major role.
- Bruce Thompson, Director, Major Projects, **Moreland Solar City** including Brad Shone, Manager - Energy Strategy (Brad was formerly ATA Energy Policy Manager) and Peter Steele, Coordinator - Urban Planning
- Bill Pemberton, Climate & Energy Officer, **Manningham City Council**
- Scott Willey, Sustainability Manager & Managing Editor of the BEDP Environment Design Guide, **Royal Australian Institute of Architects (RAIA)**
- Nikki Scott , North East Alliance - Greenhouse Action, & **Towong Shire Council**

SURVEYS COMPLETED

- Manningham City Council – Bill Pemberton, Climate & Energy Officer,
- City of Port Phillip – Matthew Trigg, Sustainable Design Officer,
- Moreland Energy Foundation Limited – Peter Steele, Coordinator - Urban Development,

STATE GOVERNMENT

INTERVIEWS HELD

- Ken Guthrie, Manager, Renewable and Distributed Energy, Sustainability Victoria

[57] Moreland City Council Sustainable Tools for Environmental Performance Strategy see www.morelandsteps.com.au

PV INSTALLERS

INTERVIEWS HELD

- Glen Morris, Solarquip

SURVEYS COMPLETED

- Solarquip – Glen Morris

OTHER

INTERVIEWS HELD

- Scott Willey, Royal Australian Institute of Architects (RAIA)
- Brett McDonald, Program Coordinator (CCP Leaders & Rural Vic), Cities for Climate Protection Australia, ICLEI Oceania
- Jenniy Gregory, Solec - wholesale PV supplier
- Neil Sephton, GreenSmart Coordinator, Housing Industry Association (HIA) – Victoria

ACT

TERRITORY GOVERNMENT

INTERVIEWS HELD

- Adam McLachlan, Code Assessment, Development Services, ACT Planning and Land Authority
- Peter O'Neill, Electrical Inspector/ Safety Officer for ACT Government
- David Hobbs, Philip Leeson Architects – ACT Heritage Advisors

SURVEYS COMPLETED

- ACT Planning and Land Authority – Adam McLachlan, Code Assessment, Development Services

PV INSTALLERS

INTERVIEWS HELD

- Natalie Bragg, Armada Solar ACT
- Phillip May, Solartec Renewables
- Green Frog Solar
- Solar Powered Solutions (ACT)

SURVEYS COMPLETED

- Armada Solar ACT – Natalie Bragg
- Solartec Renewables – Phillip May

OTHER

INTERVIEWS HELD

- Rolf Fenner, Policy advisor, Australian Local Government Association (ALGA)

QUEENSLAND

LOCAL GOVERNMENT

INTERVIEWS HELD

- Brisbane City Council: Laurie Jones (Heritage Architect), Jenny Owen (Senior Officer for Building) and Steve Schwartz (Senior Officer, Planning)

PV INSTALLERS

INTERVIEWS HELD

- Gold Coast Solar Powered Solutions

NORTHERN TERRITORY

LOCAL GOVERNMENT

INTERVIEWS HELD

- Alice Springs Town Council, Building Division and Planning Division

TERRITORY GOVERNMENT

INTERVIEWS HELD

- NT Department of Planning and Infrastructure

PV INSTALLERS

INTERVIEWS HELD

- Novolta
- Suntec

OTHER

- Project Building Certifiers

WESTERN AUSTRALIA

LOCAL GOVERNMENT

INTERVIEWS HELD

- Brad Pettitt (Councillor City of Fremantle and Dean at the School of Sustainability, Institute for Sustainability and Technology Policy, Murdoch University) and Stephanie Jennings (Southern Metropolitan Regional Council, Western Australia)

APPENDIX 9: EXAMPLES OF PV INFORMATION PROVIDED BY COUNCILS

City of Port Phillip Planning Department
St Kilda Town Hall, Cnr Carlisle Street & Brighton Road
T: 9209 6777 F: 9536 2740 E: planhelp@portphillip.vic.gov.au
www.portphillip.vic.gov.au/planning

SOLAR PANELS

A General Guide and Planning Checklist for Residents and Industry

Are you considering installing solar panels on your home or business?

The City of Port Phillip is committed to the creation of a sustainable built environment and encourages the development and installation renewable energy systems, including photovoltaic and solar hot water systems.

To ensure the planning process achieves better environmental outcomes that are also financially viable, socially cohesive and culturally relevant, Council strongly recommends consideration be given to the following:

- Unless it can be successfully integrated into the design of the building, every effort should be made to minimise the visibility of a system from the street, and its impact on surrounding properties and public areas.
- A planning permit will typically be required if the system is visible from a street (other than a lane) or a public park, and is within a heritage or neighbourhood character overlay under the Port Phillip Planning Scheme.
- Council typically does not support systems visible from the street where the existing building is deemed to be significant or contributory to local heritage.
- The historic fabric of a building should not be unnecessarily disturbed or destroyed, in line with minimum intervention and reversibility principles. That is, when a system is removed the building should be able to be fully restored.

- Solar panels, tanks and other infrastructure should not display any form of private advertising or branding.
- Avoid placing the system on or near the property boundary without first obtaining consent from the adjoining property owner(s).
- Shadows produced by the system and any associated structure should be minimised. Less bulky systems installed flush with the roof line are preferred.
- To ensure operational effectiveness, all panels should be positioned to avoid overshadowing from nearby buildings, trees and power lines/poles.

- The ideal placement for photovoltaic and solar hot water systems in Melbourne is an unshaded roof pitch of 30°, facing due north. Although, there is scope for some degree of variation from this ideal.
- Consider other conservation and efficiency measures (additional insulation, energy-efficient light bulbs, low-flow showerheads, etc.).
- Ensure that the system is installed by a qualified professional, accredited by the Clean Energy Council.

Please Note: satisfying these considerations does not guarantee approval of any planning application

See over page for more information, including the Solar Panel Checklist for Planning Permit Applications

Solar Panel Checklist for Planning Permit Applications

To assist Council in promptly processing your application, please read the following checklist carefully and ensure that you have provided all the necessary documentation. If you are unclear on any aspect of your application, we recommend you to arrange an appointment with our fast-track planner to discuss your intended proposal.

Please make sure ALL required information is provided to ensure your application can be processed.

- ❑ A signed and dated **"Application for Planning Permit" form** showing the correct address of the land, an accurate description of your proposal, as well as a current contact telephone number and mailing address.
- ❑ A full and current (within 3 months of lodging) copy of **Certificate of Title**, including a title plan/diagram showing any relevant covenants and restrictions.
- ❑ At least **two sets of all required drawings** showing the existing and proposed conditions, and their immediate context. These drawings should be drawn to scale, include a north arrow (plans only), the scale at particular paper size (i.e. 1:100@A3) and a scale bar.

  All drawings should be A3 size and unbound, unless otherwise negotiated with Council.

Streamlining the process

Council now waives the application fee associated with obtaining a planning permit for various sustainable design initiatives, including photovoltaic and solar hot water systems. These are typically processed through our Fast Track service and completed in less than 3 weeks. For more information contact the Planning Department on 9209 6424.

Unlawful installations

The City of Port Phillip's Development Compliance Team actively investigates unlawful works within the municipality, in particular those in violation of the Port Phillip Planning Scheme. Penalties apply for photovoltaic and/or solar hot water systems installed where approval is required but not obtained. Council may demand that such unlawful systems be removed at the owner's expense.

Further information

Before commencing any works please contact our Planning Department directly via planhelp@portphillip.vic.gov.au or on 9209 6424 to determine if a permit is required for your proposal and if any specific requirements apply.

A Building Permit may also be required for the installation of your system, for more information contact Council's Building Department on 9209 6253.

For more information on photovoltaic and solar hot water systems please contact our Sustainable Environment Team or Sustainable Design Officer on 9209 6777 or via sustainabledesign@portphillip.vic.gov.au

Our enquiries counter at the St Kilda Town Hall is open at the following times:

8.30am – 6.00pm Monday only

8.30am – 5.00pm Tuesday to Friday

Images: City of Port Phillip, livingwise.com.au, lifeboat.co.nz, solarlife-ent.com

Group-Buy Proposal

From

eco-Kinetics

For the

Supply, Installation & Commissioning Of Bulk Residential 1kW PV Grid-Interactive Solar Systems

Maribyrnong Group Buy

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eco-Kinetics
ACN: 135 159 527

1 Introduction

Eco-Kinetics Victoria is currently running a number of residential solar photovoltaic electricity bulk-buy programs in conjunction with various Melbourne local councils. These programs involve the supply, installation and commissioning of 1 kilowatt solar photovoltaic systems to interested households in these council areas. The programs began with Manningham and have extended to Darebin, Banyule, Whittlesea and Yarra City councils and have drawn approximately 600 households in total, in these areas.

This current Group-Buy has been organised privately and generally involves residents of the Maribyrnong area who have registered directly with Eco-Kinetics.

2 Program Key Points

2.1 When

Presentation evenings: 9th April 2009, 7.30-9.00pm
27th April 2009, 7.30-9.00pm

Registrations will close 15th May 2009.

2.2 Eligibility

The rebate eligibility criteria are as follows:

i. Total household taxable income under $100,000 for the previous financial year.
ii. The property is owned by the applicant.
iii. The property is the principal place of resident of the applicant.
iv. The solar PV system is installed by BCSE accredited technicians.
v. No rebate has previously been received.
vi. Minimum 8m^2 of Preferably North or West facing roof.

2.3 Applicable Areas

Applicable to Maribyrnong and surrounding areas (10 km) residents, other residents will be considered on a case-by-case basis. It should be noted that these schemes are run as projects in order to provide best possible pricing outcomes. Applicants that fall outside a serviced demographical area may not be eligible.

7) Switchboard and Inverter adjacent
8) No modifications required due to heritage overlay considerations
9) Allowance for Double Story is labour only. If barriers, extra rigging etc is required for safety reasons then these will be extra.

** Renewable energy and energy efficient technologies which reduce carbon emissions are eligible for the award of Renewable Energy Certificates (RECs). The number of RECs generated is determined by the carbon-offset capacity of the system, as designated by the Office of Renewable Energy Regulator. A bigger system has more RECs attached to it. A solar PV system will have different RECs award system to a solar hot water system. RECs are a form of electronic currency which is then traded on the market. As such, the value of the RECs varies from day to day.

For this scheme Eco-Kinetics will offer the value of the RECs at time of installation less 10% in the form of a rebate. The site inspector will discuss RECs individually with the resident and the resident is free to choose what to do with them. The following is an example of how we will reduce the price of the offered system by the RECs rebate.

Example: Single Story Monocrystalline

1. Resident pays $2505
2. System is installed and RECS are created and assigned to Eco-Kinetics (3 weeks)
3. Eco-Kinetics pays customer market rate of RECs less 10% (At the moment market rate is about $750)
4. Total system cost is initial outlay, $2505, less the RECs paid after installation. Using current market rate of about $750 this would be;
   $2505 – $670 = $1,835

2.5 Additional Potential Costs

2.5.1 Frame for Flat Roofs

Solar PV panels in Melbourne perform optimally when tilted to approximately 30 degrees. For houses with pitched roofs though not with 30 degrees pitch, there is no need for a frame as the performance drop will be negligible. However, for houses with a flat/very-low-pitch roof, it is recommended that a frame be installed. The extra cost of the frame will be determined during the Site visit.

2.5.2 Upgrades

In addition to the 1 kilowatt standard systems being offered, *Eco-Kinetics* is offering upgrade packages for those residents who desire from the outset. These options are outlined below with prices again given after rebate and RECs values have been deducted.

Upgrade Package	Price $
Keep 1000 W solar PV panels Upgrade 1100 W inverter to 1700 W inverter	$TBA at Site visit

Installation Kit	Aluminium extrusion mounting rails with stainless steel mounting brackets	
Cabling	Includes 20 metres	
Labour	Installation labour included	• 12 month installation warranty

All components meet the required Australian standards as determined by the Clean Energy Council / Business Council for Sustainable Energy (the governing body of renewable energy installations in Australia.)

Monocrystalline vs Amorphous

	Amorphous	Monocrystalline
Efficiency	10%	15%
Area (for 1 kw)	12.5 m^2	8 m^2
Price	Low	High
Output	High	Good
Shading	Recommended	Not Recommended
Temperature affects	Excellent	Good

2.7 Procedure and Delineation of Responsibilities/Timeline

The following is procedural outline of tasks and responsibilities (*Based on 100 applicants, timing for some items may extend depending on final registration quantities):

Stage	Responsibility	Step	Timeline*
1. Agreement	Eco-Kinetics (EK)	Terms agreed between Eco-Kinetics and residents (This document).	18/3/2009
2. Registration	Resident	• Residents apply directly to EK • Registrations may be rejected due to locality or budget considerations.	15/5/2009
3. Database	EK	• Eco-Kinetics to maintain list of registered residents	Ongoing
4. Site Evaluations	EK EK, Resident Resident	• Households inspected and quote signed • Residents' rebate application completed • Deposit taken when quote accepted	Start: 20/4/2009 Finish: 15/6/2009
5. Paperwork Processing	EK	• All required paperwork finalised and sent off	3 weeks after site visit

Residential Solar PV Group-Buy Program

Frequently Asked Questions

This FAQ Document relates to the bulk Solar PV Group Buy program for residents of the Melbourne area. Eco-Kinetics is offering the opportunity to purchase a 1kW solar panel system to produce emissions-free renewable electricity for your home.

Please also note that while Eco-Kinetics will act as provider and facilitator of the program, changes in such things as government legislation and electricity retailer and distributor practices are beyond the control of Eco-Kinetics. The renewable electricity market is a dynamic arena that is undergoing much rapid evolution at the moment. Eco-Kinetics will keep customers informed of such changes though cannot take responsibility for them beyond the supply and installation of solar photovoltaic systems.

All frequently asked questions are listed here. Please read them closely and carefully. If you have a question that does not appear on this FAQ then please contact Eco-Kinetics.

For Registration, please call or email;

Nicole Hind :- 9708 6714 or nhind@eco-kinetics.com

For Technical or other enquiries please call,
Eco-Kinetics Victoria P/L
Phone: +61 3 8786 3003
Fax: +61 3 8786 3001
Email: eambrus@eco-kinetics.com
www.eco-kinetics.com

Question Categories

1. PROGRAM OVERVIEW
2. PARTICIPATION
3. COSTS AND PAYMENT
4. TECHNICAL AND INSTALLATION
5. METERING, RETAILERS AND DISTRIBUTORS
6. RECS (RENEWABLE ENERGY CERTIFICATES)
7. OTHER

eco-Kinetics
ACN: 135 159 527

2.4 Pricing

SINGLE STORY*

	Std Single Story (Less Rebate of $8000)	Std Single (Less rebate and RECS)**
Monocrystalline	$ 2,515.00	$ 1915.00
Amorphous	$ 1,555.00	$ 945.00

DOUBLE STORY*

	Std Double Story (Less Rebate of $8,000)	Std Double (Less rebate and RECS)**
Monocrystalline	$ 3,005.00	$ 2,405.00
Amorphous	$ 2,045.00	$ 1,445.00

N.B:- prices not applicable to Citipower areas.

Notes on Pricing: - The quoted prices have the following conditions attached to them.

a) Prices are given for single storey, double storey, flat, tile and tin roof combinations.
b) Prices are given for "standard installations". See Section below for further details.
c) Prices are given after the federal government's Solar Homes and Communities Plan rebate of $8000 has been deducted
d) It should be noted that the customer need not finance the $8000 rebate amount. Eco-Kinetics finances the $8000 gap on behalf of the resident and the rebate is paid directly to Eco-Kinetics by the Government after the installation report has been submitted.

*** Prices are based on "Standard Installs" which is clarified below;**

One of the purposes of a site inspection is to determine whether the installation can be categorised as "standard" and, if not, to determine what the additional cost will be.

A standard installation consists of:

1) Roof pitch less than 25 degrees
2) Tile or metal roof (no slate)
3) Easy and safe access to suitable roof face
4) Contiguous array (i.e. No separation required of any PV panels due to roof layout, air conditioning units on roof etc)
5) Existing switchboard wiring conforms to Australian standards
6) Twenty (20) meters or less of wiring between PV panels, inverter, switchboard and meter.

Keep 1000 W solar PV panels Upgrade 1100 W inverter to 2500 W inverter	$TBA at Site visit
1.7 kW mono-crystalline PV panel system	$TBA at Site visit
2.5 kW mono-crystalline PV panel system	$TBA at Site visit
1.7 kW Amorphous PV panel system	$TBA at Site visit
2.5 kW Amorphous PV panel system	$TBA at Site visit

Please note: While it is possible to upsize inverter without upsizing the PV panel size, it is not recommended or advised. Inverters have a performance curve of efficiency. DC to AC conversion efficiency is adversely affected if input DC is far from rated wattage/voltage.

2.5.3 Metering

All households installing solar PV for the first time will require a new meter to replace their existing one. Even if houses have recently had a new meter installed, it will not be able to accommodate the outward "export" flow of electricity to the grid. A digital bi-directional meter is required as minimum.

All meter request changes will be via the resident's electricity retailer and distributor and is a charge passed onto the resident by their retailer. This extra charge is usually around $200. Residents should ring their retailer in order to ascertain the cost of replacing their meter.

Eco-Kinetics will initiate the meter replacement by your retailer after the installation is complete

2.6 Components

The product being offered is a 1 kilowatt grid-connected solar photovoltaic (PV) system, fully installed. The product package consists of the following components:

Component	Detail	Warranty
PV Panels	6 x 170 Watt mono(poly)-crystalline panels (8m^2) (Conergy or equivalent*) **Or** 8 x 125 Watt Amorphous panels (12.5m^2) * Eco-Kinetics purchase their materials in bulk directly from manufacturers overseas, as such, PV selection is based on availability and best price practise.	• 5 year product manufacture warranty • 80% nominal power performance guarantee at 25 years
Inverter	SMA SunnyBoy SB1100	• 5 year warranty

6. Reporting	EK to residents	• Regular (as progress is identified) emails** updating residents of progress ** Email address must be given to receive correspondence.	Ongoing
7. Rebate approved	Resident (&EK)	• Balance payment received from resident	Approx. 11 weeks after site visit
8. Installation	EK/Installer/Resident	• Solar PV Installation date set with customer • Installation completed • Safety check and commissioning • Installation Report submitted	Approx 15 weeks after Site visit
9. New electricity meter installed	Resident (&EK) to Elec. Retailer	• A bi-directional interval meter installed after solar PV installation	Not in our Scope, Time dependant on individual retailer
10. RECS paid (If previously agreed)	EK and resident	• Rebate for RECS paid to resident by Eco-Kinetics.	3 weeks after installation
11. Rebate paid	EK	• EK receives rebate from federal government	8 Weeks after installation

2.8 Contact Details

For Registration, please call or email;

Nicole Hind :- 9708 6714 or nhind@eco-kinetics.com

For Technical or other enquiries please call,
Eco-Kinetics Victoria P/L
Phone: +61 3 8786 3003
Fax: +61 3 8786 3001
Email: eambrus@eco-kinetics.com www.eco-kinetics.com

2.9 Further Questions?

Please see the FAQ's

eco-Kinetics

Frequently Asked Questions
Residential Solar PV Bulk-Buy Program

PROGRAM OVERVIEW

1) What is this program?

This program is for the supply, installation and commissioning of a 1 kiloWatt solar photovoltaic (PV) electricity generating system across a large number of homes in your area. The program is facilitated eco-Kinetics so as to aggregate a large number of residents and thus obtain a discounted bulk-buy price on your behalf.

2) Who is running the program?

Eco-Kinetics is the private company provider. Eco-Kinetics are renewable energy and energy efficiency specialists. We are responsible for similar group buy programs that are occurring in Manningham, Darebin, Banyule, Whittlesea and Yarra City Councils where over 600 households have decided to have a 1 kiloWatt solar PV system installed. These programs are happening at the same time as the Queensland Solar Homes program where we are fitting out over 1000 households with PV systems, in conjunction with the Queensland state government.

3) Why should I take advantage of this program?

There are a number of reasons warranting participation in this solar PV bulk-purchase program:

- Solar PV is a renewable energy technology capable of assisting in climate change mitigation and environmental sustainability efforts, and alleviating ever-increasing electricity prices.
- As of July 1, the current rebate which makes residential solar PV financially feasible is being changed to a system which is far less attractive for currently eligible residents. (See Costs and Payment for further details on the rebate.)
- A bulk-buy scheme provides the lowest possible price taking advantage of economies of scale.

PARTICIPATION

4) How do I go about looking into this offer further and taking it up?

The first step for taking up this special offer is to do a basic home self-assessment to see if your home is somewhat suitable. Check that you have a somewhat northerly roof aspect which has at least 8 sq. metres of usable rectangular area that isn't shaded much.

After considering your house and the information presented by Eco-Kinetics, you can participate in the program by registering your interest with Eco-Kinetics.

Following registration, you will be contacted by Eco-Kinetics to arrange a site inspection of your house.

5) How do I know if I might be suitable for solar panels?

All you need is a roof space with a somewhat northerly aspect, with a usable rectangular area of at least 8m2 with minimal shading. If you are unsure you can speak to our friendly staff, but only through a site inspection will we be able to confirm this. Remember the panels are rectangular which must be kept in mind when estimating the usable area of your roof. It is not permissible to have panels overhanging the roof.

6) How long does a site visit take?

Please allow 1 hour for the site visit. It will be quicker if you are prepared with the necessary documents and having read these FAQs. Please be prepared as we will have many other houses to attend to in a short time-span.

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7) When are the site visits being done?

The site visits are beginning as soon as possible. While you don't hear from us, please be patient – someone obviously needs to be last but we will get to everyone.

8) Will I be contacted or do I have to phone Council or Eco-Kinetics. And how soon?

Once you have registered, please wait and be patient. Eco-Kinetics will contact you to arrange a site visit. We will do this as soon as we can, particularly given the urgency that the rebate system will end on June 30.

9) What do I need at the site visit?

Photocopies of the signee's rates notice, driver's license (both sides!), a recent electricity bill and $300 cash, cheque or money order, as the deposit. PLEASE ENSURE that your drivers' license and rates notice reflect the installation address, which will also be your principal place of residence (a rule of the rebate system). If these documents don't show this, THEN YOU MUST UPDATE YOUR DRIVERS LICENCE BEFORE WE CAN PROCEED!!

If you are currently building the future installation address, then you must submit a statutory declaration indicating that it will be your principal place of residence from a given date.

10) Do I have to accept the quote at the site visit?

No, but it would accelerate and smooth the process a lot. You have 5 business days to accept the quote.

11) Is there a charge for the site visit?

Eco-Kinetics needs to prepare a comprehensive suite of documents before arriving at your house. This coupled with the time taken on site adds to the cost of the program. It is expected that the customer has done their homework regarding eligibility and installation parameters before registering. A site visit fee of $50 will be required if resident does not proceed with installation.

12) How do I book in for a site visit?

You must register with eco-Kinetics.

13) Who are the provider and installer?

Eco-Kinetics is supplying and installing the solar PV systems. Only BCSE accredited installation personnel are employed, in line with rebate approval conditions.

14) Should I get solar PV or solar hot water?

Both. Dollar-for-dollar, GHG for GHG, solar hot water is far more effective than solar PV electricity. However, both heating and electricity are necessary and given this group buy opportunity and with the potential removal of the PV rebate, it is worthwhile pursuing solar PV now and solar hot water in the near future.

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Frequently Asked Questions
Residential Solar PV Bulk-Buy Program

COSTS AND PAYMENT

15) How much does the 1 kiloWatt system cost?

This is detailed in Group Buy specification.

16) Can I get a bigger system?

Yes, it is possible to get a 2.0 kW PV system but please also consider the following points:

A 1kW system is the best value for money as it equates to the maximum rebate from the Federal Government. Anything beyond 1 kW comes totally out of your pocket, at this stage. In the future there could be incentives to expand existing PV systems thus giving you some financial assistance for the extra Wattage.

The Victorian Feed-In Tariff is coming into effect in 2009, coinciding with your installation. These allows for the sale of your excess renewable energy at a much higher price (60c/kWh) than you buy (16c/kWh). Electrically speaking, the 1 kW PV system alone may not cover your total load. Financially speaking, however, you will cover a much greater financial load and possibly even generate credit in summer. Your payback period is reduced.

Solar hot water and energy efficiency measures, such as energy efficient lighting, draft stoppers or the Ecoman standby power saver, are also a wise avenue to pursue. Dollar-for-dollar they are actually more effective than solar PV. The Eco-Kinetics Site Inspector will discuss with you how you can cheaply and easily bring down your electrical load so that, not only do you reduce your emissions, but generate more excess solar electricity to sell!

If climate change and environmental care are of utmost importance to you, then purchasing GreenPower through your electricity retailer is also an excellent way of allocating your resources to reduce emissions.

A standard 2.0 kW system will require extra northerly roofspace area.....please keep this in mind.

17) Why might I be charged more than the standard price for single story or double story installation?

The listed price is the base price for a "standard installation". Surcharges are applied in situations falling outside this. This may be for something like splitting/separating the 6 solar PV panels, separation of the switchboard from the meter, long distances between the panels, inverter and meter etc. The extra charges are to cover the extra labour and materials required

18) What do I need to do after I pay my deposit?

Wait. Please be patient. There is nothing to do until you receive your rebate approval letter from the government. Rebate approvals are expected to take about 2 – 3 months.

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19) Is the balance payable exclusive or inclusive of the rebate?

The quoted price is what the customer pays. Eco-Kinetics, the supplier, carries the $8000 cost and the rebate (refer to point 14) will be assigned to them after the system is installed and operating. Please note, the quoted price does not include the necessary meter upgrade. This is a matter directly between you and your electricity retailer.

20) What is the Federal Government rebate and am I eligible?

The rebate is for $8000 for a maximum 1 kW system. To be eligible, you need to be an owner-occupier with a family taxable income of under $100,000. For more information on the rebate and your eligibility visit: http://www.environment.gov.au/settlements/renewable/pv/pubs/shcp-residential-guidelines-21may2008.pdf

21) Is the rebate going to run out?

Yes. More accurately, the rebate system is going to change from July 1 to an offer which is far less attractive to householders eligible for the current rebate. This is why there is a need to act promptly and efficiently so as to have as many rebate applications submitted to Canberra by June 30.

22) What is the rebate changing to?

One change will be the scrapping of the $100,000 income means test so for those householders currently ineligible on these grounds any change will be an improvement. For those residents eligible under the current scheme, however, the change will be a backwards step.

At the moment, the rebate discount has two parts: 1. The $8000 grant component and 2. A discount due to the sale of Renewable Energy Certificates. At the moment, this is approximately $700 but varies according to market value. So, overall, a price reduction of over $8500 is available.

From July 1, the rebate scheme will rely exclusively upon the sale of Renewable Energy Certificates which will be valued more highly. However, any grant-style component such as the current $8000 will be eliminated. Overall, your effective rebate under the new system would amount only to about $4500 rather than $8500, for those who are eligible for the current rebate.

23) Can I still participate if I am not eligible for the rebate?

Yes. If you are not eligible for the rebate you can still proceed. The cost of stand installation will be the standard price + $8,000. However, it is recommended that you wait until the new scheme is established which will have relaxed eligibility criteria.

24) When do I pay the $300 deposit?

At the site inspection. Otherwise, if you need time to consider, you have 5 working days to post all signed documents with deposit payment.

25) When do I pay the balance of the quote?

The balance of payment is paid BEFORE installation, within 10 working days after receiving the letter of rebate approval from the federal government. This will ensure that material will be ordered fro your installation. Please note that material is ordered from overseas.

TECHNICAL AND INSTALLATION

26) How long does installation take?

The majority of the installation will take less than one day, in most cases. However, please allow one week for complete commissioning and certification.

27) What sort are the panels?

Depends on system chosen, mono-crystalline requires 6 x 170 Watt panels, whereas amorphous requires 8 x 125 Watt Panels

28) What is the lifetime of the panels?

While the performance Guarantee is for 25 years, the panels expected lifetime is at least 40 years.

29) What is the lifetime of the inverter?

Similarly, while the warranty is for 5 years, the inverter should operate well for 15 years.

30) Is it possible to upgrade/expand panels and/or inverter?

Yes, it is possible to expand your system at any stage adding more PV panels and a larger capacity inverter. Should you do this from the outset? Please see Question 9 regarding bigger systems for the answer to this question.

We are happy to provide larger systems from the outset but we also believe it to generally be in the best interest of the customer and the environment to go with a 1kW system for the moment. At this point in time, the extra funds are more worthwhile being devoted to energy efficiency measures, a solar hot water system and/or a GreenPower plan through your electricity retailer.

31) Will my PV system account for all my household electricity consumption?

Averaged over the year, in most cases, no. The Australian average household uses 16 kWh (kiloWatt-hours) per day. This system will provide 4, at most, averaged over the year. This could be as high as 8kWh per day in summer and as low as 2 kWh per day in winter.

However, with the Victorian Feed-In Tariff coming into play in 2009 where you can sell your excess solar electricity at 60c/kWh and buy from the grid at your current price of 16c/kWh, you can account for an even higher percentage of your electricity bill, even potentially generating a credit in the summer months.

32) Will the technology be outdated soon?

All technologies get superseded. However, it is forecast to be quite a while before significantly better solar cell technologies, such as the sliver cells, are commercially available at these prices. In any case, electricity is electricity and newer technologies will be able to be incorporated into the old.

33) What if I have a flat or low-pitched roof?

For those roofs with a flat or very-low-pitched roof (below 10 degrees), it is recommended to have a frame installed to elevate the panels to approximately 30 degrees pitch. The extra expense is offset by the improved performance of the system due to being at the optimal tilt angle for Melbourne.

34) Black out? Will my solar PV panels provide me with electricity during a black out?

No. Regulations stipulate this is not possible.

35) What if my roof is not facing north? My roof faces east-west.

The roof need not be facing due north. At 45 degrees off north, the loss is a very reasonable 8%. Even at 90 degrees, i.e. an east-west roof, the loss is only approximately 25%.

36) How big is the inverter?

When hung on the wall, 45 cm wide x 35 cm high x 25 cm deep.

37) My meter is near my front door. Do I have to have the inverter near my meter?

Ideally the inverter goes near the switchboard and/or meter. This incurs the minimum cost. However, with heritage overlay considerations, inverters probably cannot be allowed to be seen from the street. This means inverters may have to be moved from the ideal location possibly incurring an extra fee. An idea of extra cost to move the inverter would be $150 - $250 but this depends on the particular circumstances and is determined at the site visit.

38) What warrantles are being offered?

One year warranty on installation. 5 years on the Sunnyboy inverter. PV Panels – 5 year product warranty; 80% power performance guarantee at 25 years.

39) What is solar PV?

PV (PhotoVoltaic) solar panels generate electricity directly from sunlight, not from heat.

40) What happens when I'm not generating as much electricity as I am using?

At these times, you will be importing (buying) electricity from the grid as well.

41) What happens to the excess electricity that I produce during the day?

Under the Victorian Feed-In Tariff from 2009, any unused solar PV generated electricity is sold at the Feed-In Tariff rate of 60 cents/kiloWatt-hour. (About 4 times the buying price).

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METERING, RETAILERS AND DISTRIBUTORS

42) Must I get a new meter?

Yes. Everyone needs a new meter in order to accommodate import AND export of electricity.

43) I had a new meter installed within the last 2 years? Will this one be suitable?

No. It may be digital, it may look swish but it still has not been set up to export electricity.

44) How do I go about getting a new meter?

After installation of your PV system, our installer will issue a request to your retailer to have a new meter installed. Your electricity retailer (the retailer of your choice) will then organize for your electricity distributor (geographically dependent) to come out and install a new meter. This may take a number of weeks to complete.

45) **What sort of meter will be installed?**

A digital bi-directional interval meter will be installed, which will be capable of taking advantage of the Victorian Feed-In Tariff.

46) **How much will a new meter cost?**

This will depend on what area you live in and which electricity distributor covers that area. Please ring your retailer for these costs.

47) **Who do I contact about the metering side of things?**

When it comes to following up on your new meter installation and paying for it, you must contact your electricity retailer. Beyond requesting a new meter on your behalf, anything to do with metering is completely beyond our control and jurisdiction.

RECs

48) What is a Renewable Energy Certificate (REC)?

RECs are forms of electronic carbon currency. Many devices or installations, including residential solar PV, that reduce carbon emissions have an REC value attached to them. RECs can be traded for money or "surrendered" / "retired" (removed from trading circulation) to further benefit the environment.

49) What number of REC's would the system be eligible for?

In Melbourne, a 1 kW system generates 17 RECs.

50) **Does the installing company offer to purchase these? At what price?**

If customers choose to sell their RECs, Eco-Kinetics will facilitate this process. The price of the RECs would be determined at the time, based on market values, but as an estimate $600 would be a ballpark figure.

OTHER

51) Are my panels covered by insurance?

Yes, they would be covered by your home insurance policy but you need to inform your insurance company of your solar PV installation.

52) What is the maximum kW capacity of the SMA SunnyBoy 1100 inverter?

Nominal capacity is 1100 W although in some cases it can accommodate 1200 W.

53) Where is the inverter manufactured?

Germany.

54) Is it weather proof and therefore can it be installed externally or will it have to be installed internally or a weather proof box?

The inverter is weatherproof. It can hang on any external wall where there is no sustained, intense, direct sunlight. If more suitable, the inverters can be installed internally provided there is adequate air ventilation.

55) In what country are the panels manufactured?

The panels are manufactured in China or Taiwan

56) If I believed my panels were performing below this warranted power output what would be the procedure for making a claim?

a) Ensure your suspicions are reasonably accurate. Be sure to keep in mind local current weather conditions as well as the particular circumstances of your site. Also, the system has inbuilt inefficiencies, the inverter is rated at 93% and other cable losses etc may be apparent.
b) Call Eco-Kinetics. We will arrange for a BCSE accredited electrician to come out and inspect.
c) Based on the outcome of the inspection, Eco-Kinetics will arrange the warranty procedures.

57) How would the output of the panels be tested & who by? On-site or would they need to be removed? What costs would be involved and who would cover them?

The panel performance should first be monitored by the resident, over a period of sufficiently good weather, through the inverter digital display. If it's likely there is inferior performance, a BCSE accredited electrician will come to test the system on-site. Many problems can be resolved on-site in consultation with suppliers. Failing this, the panel(s)/inverter(s) would be removed and returned to the manufacturer for inspection and/or replacement.

The warranty is a back-to-base arrangement, for both the panels and the inverter, covering the replacement /repair of faulty equipment. The warranty does not cover shipping and transportation costs nor the costs of the inspecting electrician.

58) Does a similar warranty apply to the inverter efficiency?

Inverter efficiency depends on input voltage, which depends on sunlight and the particular circumstances of the site. Should these remain comparatively constant, then the performance of the inverter is covered by a similar warranty.

59) What is the expected AC energy delivered/off-set for a typical installation?

A typical installation can expect to average 3.5 – 4 kWh per day, averaged over the course of the year. In summer, it could get as high as 8 kWh per day; in winter, as low as 2 kWh per day. Obviously these figures depend on the particular circumstances of the site, e.g. house orientation, pitch of the roof, shading levels, weather fluctuations etc.

60) Is this based on tested/measured outputs for existing installations or calculated?

Both. Panels and inverters have been tested in-situ as well as in laboratory situations. Estimated forecasts of performance are based on these tests and standard meteorological data for the region.

61) If it is calculated, what are the assumptions / basis for the calculation (eg. sun-input levels, operating temperature, inverter efficiency)?

Standard test conditions: Radiation Output 1000 W/m^2
Spectral density of AM 1.5
Cell temperature 25°C

62) Is the energy output warranted over the life of the system?

The warranty is for 80% nominal power output at 25 years. That is, you should be generating at least 800 W in ideal conditions in 25 years time.

63) Rental market?

NO. The rebate requires owner-occupancy. No rental houses. No holiday homes.

64) Public housing.

NO. Again, the rebate calls for owner-occupancy.

65) Community housing - who owns the building?

There are special grants to fit community buildings with solar PV systems and other energy, water and resource efficiency tools. This program does not apply to such buildings but Eco-Kinetics can assist community groups with any energy and sustainability needs.