AUSTRALIAN PV INSTITUTE

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International Energy Agency Report Confirms Low Health Risks from PV Fires

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A recent report by the International Energy Agency Results shows negligible risks for chemical contamination due to run-off resulting from fire-fighting activities and no cancer related health effects.

The report, delivered through the PV Power Systems Programme, conducted a comprehensive fire hazard analysis to assess potential impact on human health in the relatively rare event of a fire on buildings with rooftop solar PV modules. It looked at airborne emissions under worse-case scenarios for different solar technologies and building sizes, as well as the potential for indirect contamination due to water run-off during fire-fighting activities. The work was led by the US National Renewable Energy Labs, and used accepted US Environmental Protection Agency models and testing protocols.

Renate Egan, Chair of the Australian PV Institute (APVI) said " the good news is that the results showed negligible risks for chemical contamination due to run-off resulting from fire-fighting activities and no cancer related health effects, with both being well below levels advised by regulatory agencies. "

The detailed study assessed the health risks to the general public from exposure to emissions when rooftop PV modules are exposed to fire. It measured a range of potential conditions, such as the length of exposure to fire emissions, weather conditions and building downwash. Smaller or larger module arrays and building size combinations were also taken into consideration.

The report assessed the airborne emissions using the United States Environmental Protection Agency (USEPA) recommended modeling approach and determined the worst-case impacts for lead and cadmium; the highest priority chemicals in the most commonly used PV technologies.

For short-term (acute) inhalation, exposures were evaluated through the Acute Exposure Guidelines (AEGL) published by the USEPA and Protective Action Criteria (PAC) published by the United States Department of Energy. These guidelines represent the threshold exposure limits for the general public and are applicable to acute exposure periods ranging from 10 minutes to 8 hours. The study results suggest that for all building/module sizes and for all averaging times (10 minutes to 8 hours) each of the chemicals came in below the AEGL and PAC thresholds.

The potential incremental cancer risk associated with one-time, acute inhalation exposure was assessed using established USEPA inhalation risk assessment methodology. The study found that under the examined scenarios, the incremental cancer risks associated with inhalation of lead and

cadmium that might be released from photovoltaic modules in small, medium, and large building fires are less than the one in a million risk level. This is typically considered to be a negligible risk level by regulatory agencies, such as the USEPA.

Potential indirect impacts associated with each fire scenario were also considered. Extinguishing the fire with water may result in chemical transport to soil and/or groundwater, however the results were well below risk-based screening levels and maximum contaminant levels from USEPA.

Overall, the potential risk from the chemicals studied across all the scenarios is negligible.

For further and complete information on this study, you can download the full 'Human Health Risk Assessment Methods for Photovoltaics Part 1: Fire Risks' report which can be accessed via the APVI. http://apvi.org.au/reports/

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About the APVI

The Australian PV Institute is a not-for-profit, member based organisation which focuses on data analysis, independent and balanced information, and collaborative research. Our objective is to *support the increased development and use of PV via research, analysis and information.* The APVI promotes solar through its live solar mapping platform [http://pv-map.apvi.org.au], the national solar research conference and Australia's participation in two International Energy Agency (IEA) programs – PVPS (Photovoltaic Power Systems) for solar photovoltaics and SHC (Solar Heating and Cooling), concerned with new solar thermal products and services.