



UNSW
SYDNEY

NEMOSIS: NEM Open-Source Information Service

Change in the NEM is driving increasing stakeholder interest

Increasing deployment of :

- Wind
- Solar
- Energy storage

Withdrawal of:

- Older thermal generators

Almost all the data used in the central dispatch process is available

nemweb.com.au -

/Data_Archive/Wholesale_Electricity/MMSDM/2018/MMSDM

[\[To Parent Directory\]](#)

Friday, November 16, 2018	1:02 AM	821	PUBLIC_DVD Ancillary Recovery Split 201810010000.zip
Friday, November 16, 2018	1:02 AM	376	PUBLIC_DVD Auction 201810010000.zip
Friday, November 16, 2018	1:02 AM	444	PUBLIC_DVD Auction Calendar 201810010000.zip
Friday, November 16, 2018	1:02 AM	510	PUBLIC_DVD Auction IC Allocations 201810010000.zip
Friday, November 16, 2018	1:02 AM	516	PUBLIC_DVD Auction Tranche 201810010000.zip
Friday, November 16, 2018	1:03 AM	3601646	PUBLIC_DVD BidDayOffer 201810010000.zip
Friday, November 16, 2018	1:03 AM	915869	PUBLIC_DVD BidDayOffer D 201810010000.zip
Friday, November 16, 2018	1:02 AM	29846	PUBLIC_DVD BidDetailDetails 201810010000.zip
Friday, November 16, 2018	1:02 AM	10631	PUBLIC_DVD BidDetailDetailStrk 201810010000.zip
Friday, November 16, 2018	1:18 AM	48172664	PUBLIC_DVD BidPerOffer 201810010000.zip
Friday, November 16, 2018	1:56 AM	129450432	PUBLIC_DVD BidPerOffer D 201810010000.zip
Friday, November 16, 2018	1:03 AM	593	PUBLIC_DVD BidTypes 201810010000.zip
Friday, November 16, 2018	1:03 AM	370	PUBLIC_DVD BidTypeStrk 201810010000.zip
Thursday, November 15, 2018	10:38 PM	4453	PUBLIC_DVD Billing CO2E Publication 201810010000.zip
Thursday, November 15, 2018	10:38 PM	419	PUBLIC_DVD Billing CO2E Publication Trk 201810010000.zip
Friday, November 16, 2018	1:03 AM	23688	PUBLIC_DVD BillingCalendar 201810010000.zip
Friday, November 16, 2018	1:04 AM	1387	PUBLIC_DVD BillingDayTrk 201810010000.zip
Friday, November 16, 2018	1:04 AM	7878	PUBLIC_DVD BillingRegionExports 201810010000.zip



Almost all the data used in the central dispatch process is available

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25 GB /
month

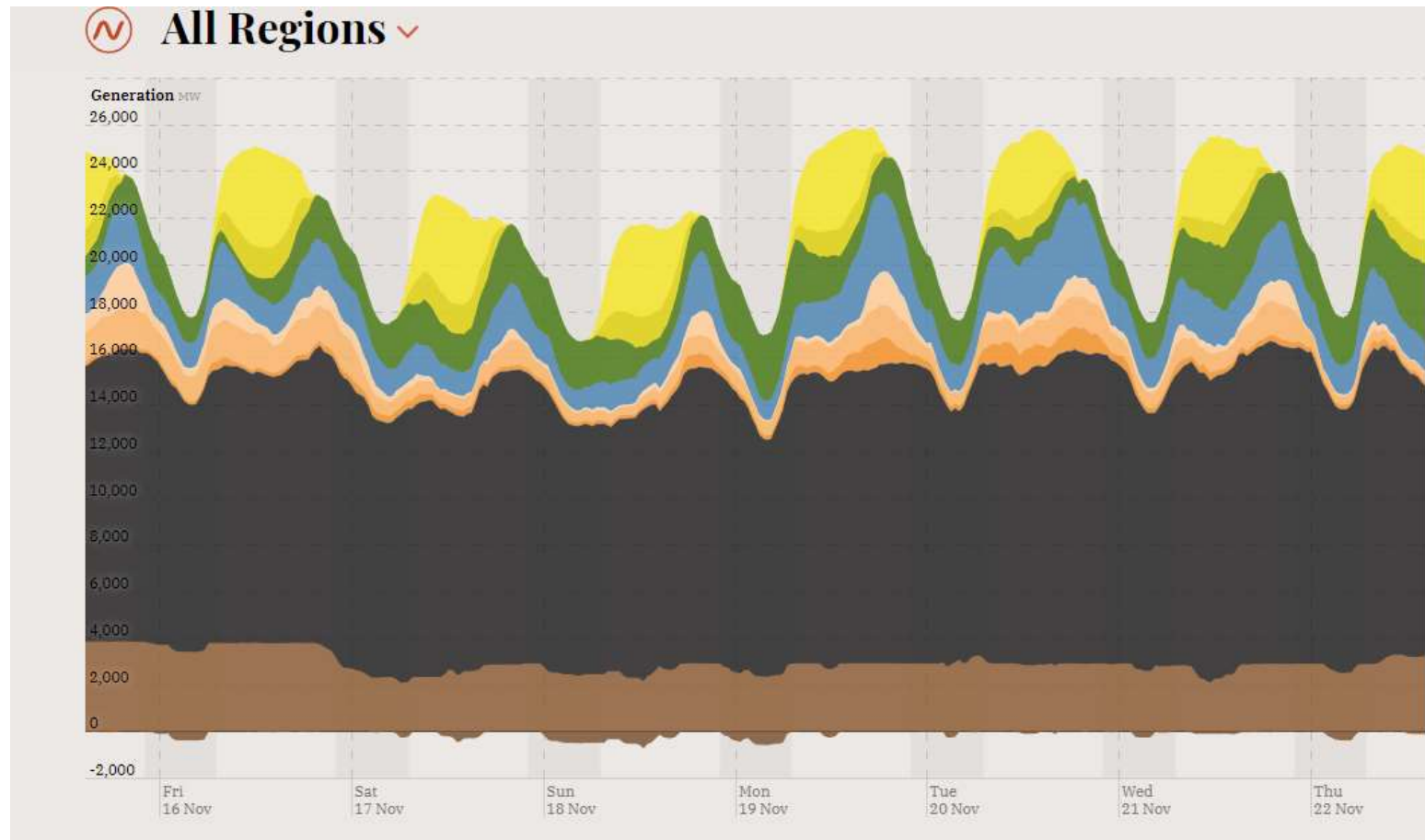


There are already many ways to access data from AEMO, why another one?



There are already many ways to access data from AEMO, why another one?

OpenNEM



There are already many ways to access data from AEMO, why another one?


- Transparency
- Ease of use
- Breadth of data
- Flexibility




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- 
- Open-Source


There are already many ways to access data from AEMO, why another one?

- Transparency
 - Ease of use
 - Breadth of data
 - Flexibility
- 
- Open-Source
 - Graphical user interface

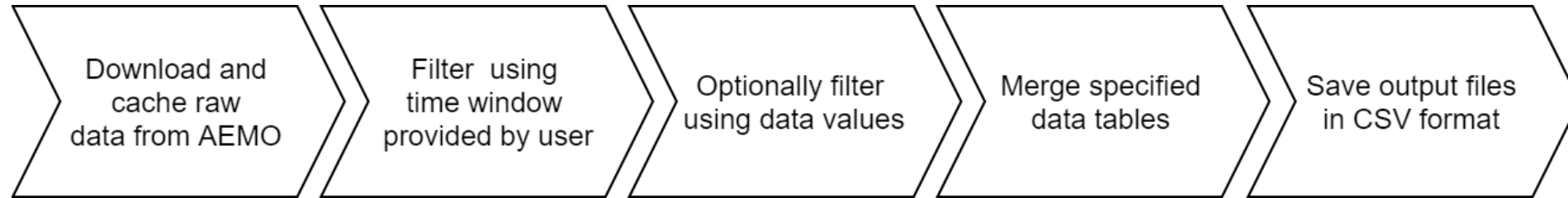
There are already many ways to access data from AEMO, why another one?

- Transparency
 - Ease of use
 - Breadth of data
 - Flexibility
- 
- Open-Source
 - Graphical user interface
 - Minimal processing

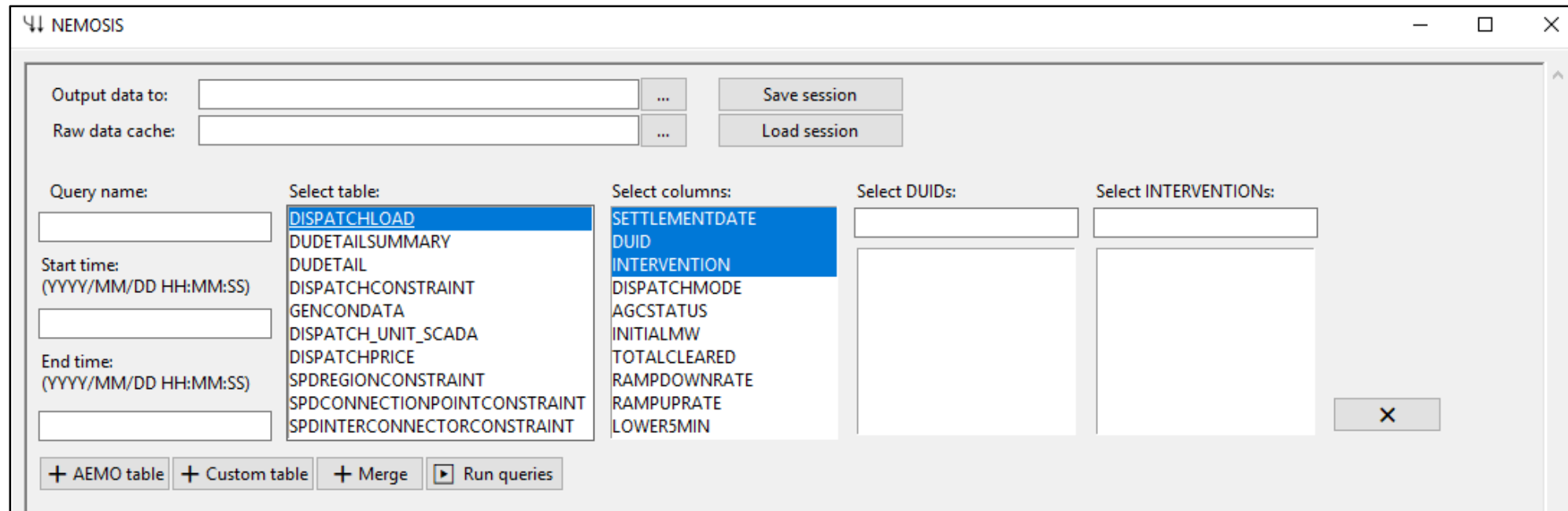
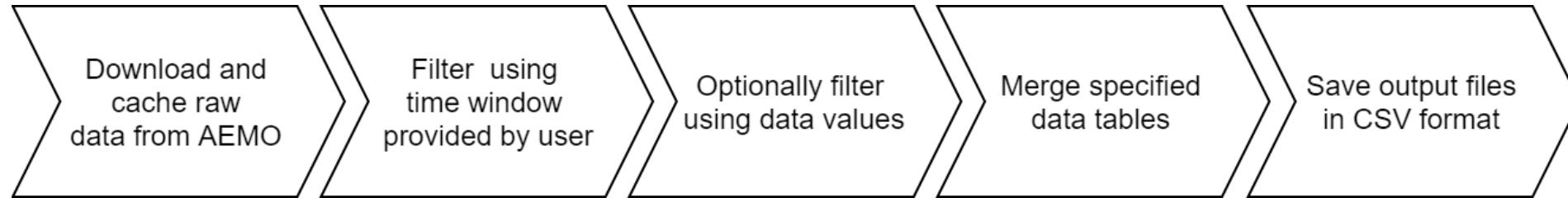
There are already many ways to access data from AEMO, why another one?

- Transparency
 - Ease of use
 - Breadth of data
 - Flexibility
- 
- Open-Source
 - Graphical user interface
 - Minimal processing
 - Custom tables

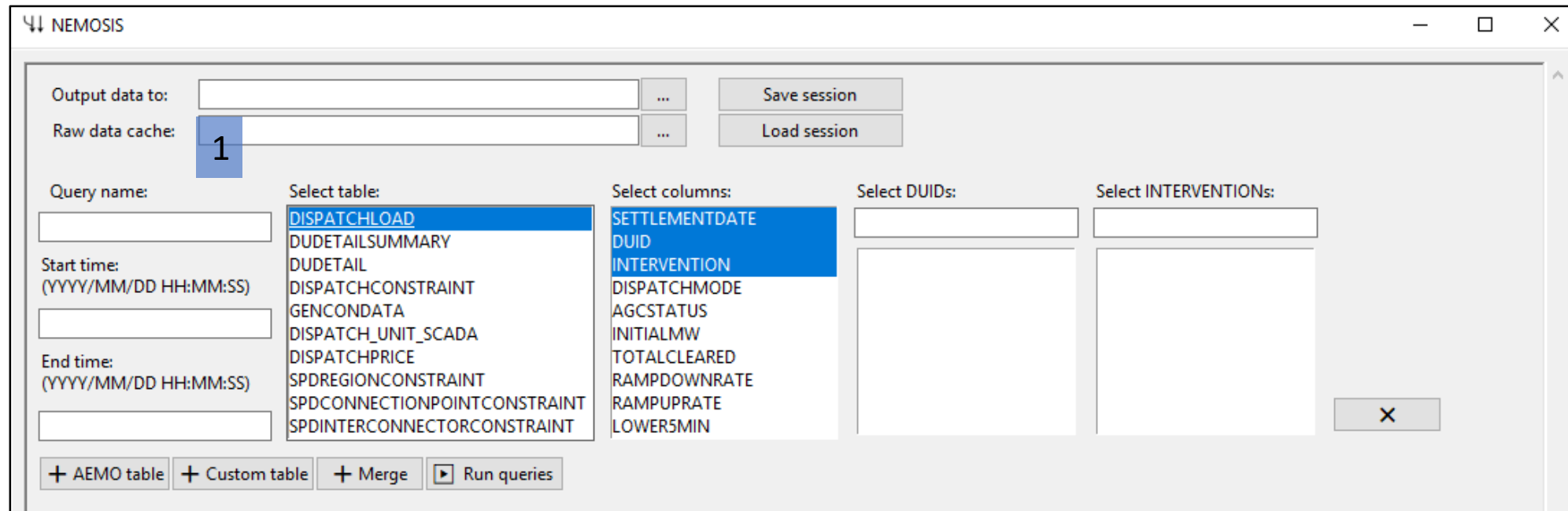
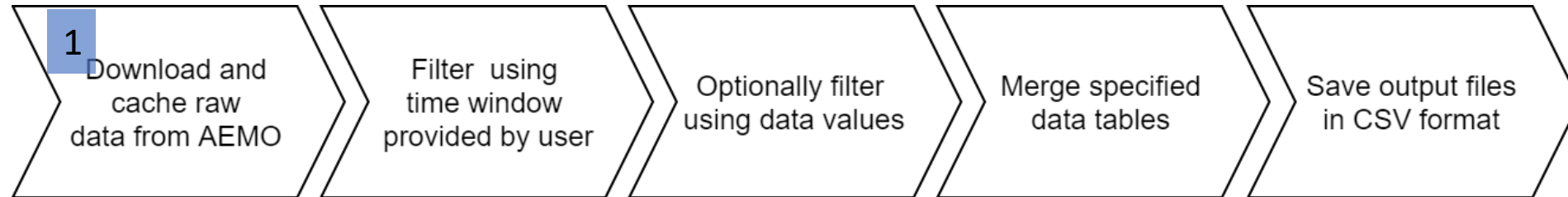
Accessing an AEMO data table



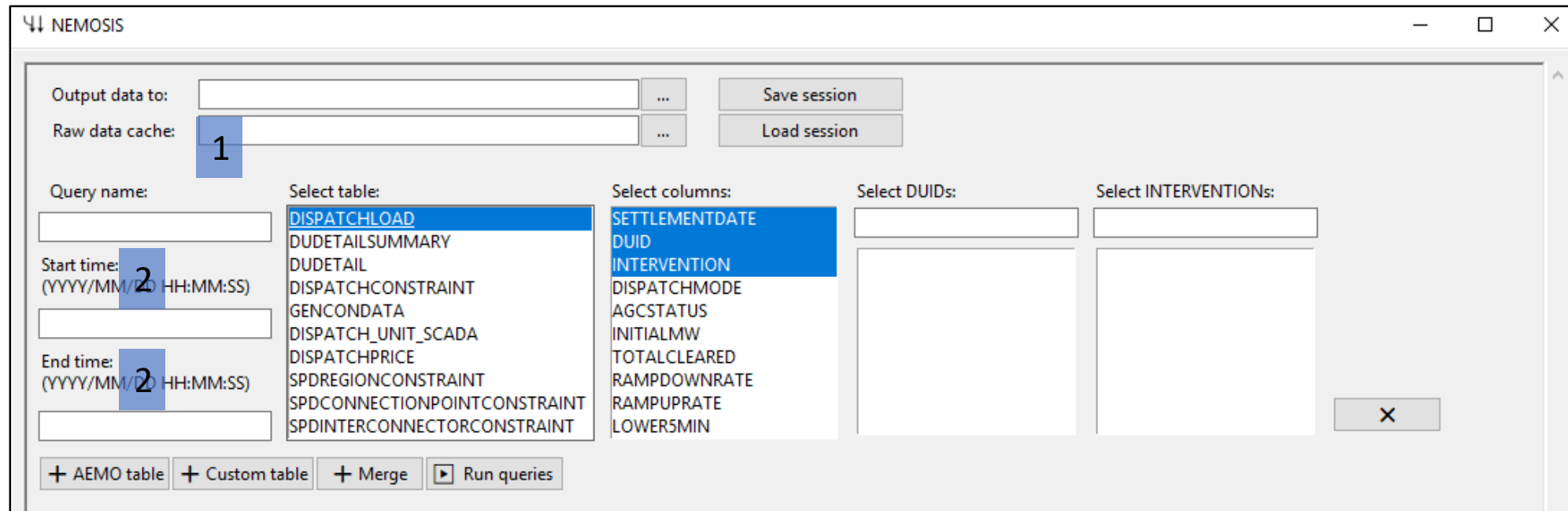
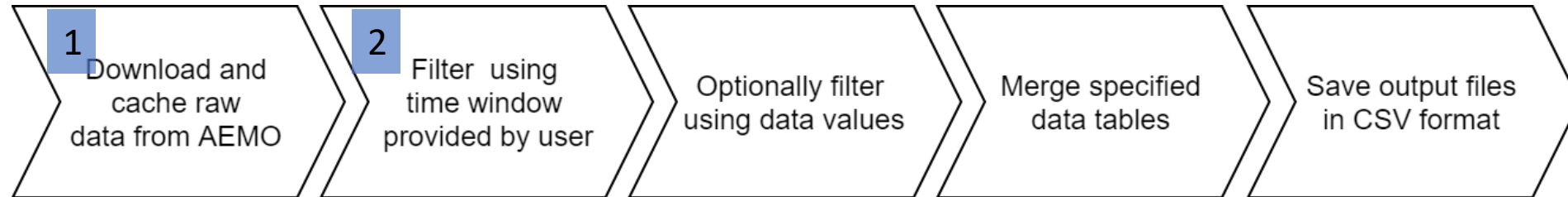
Accessing an AEMO data table



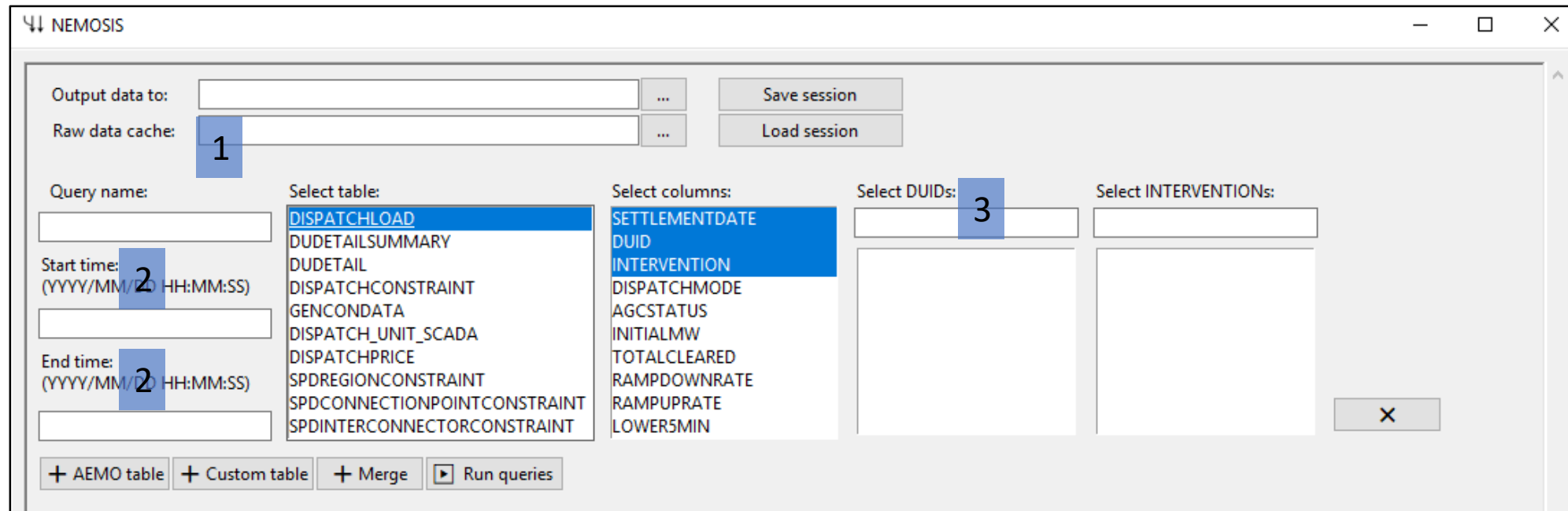
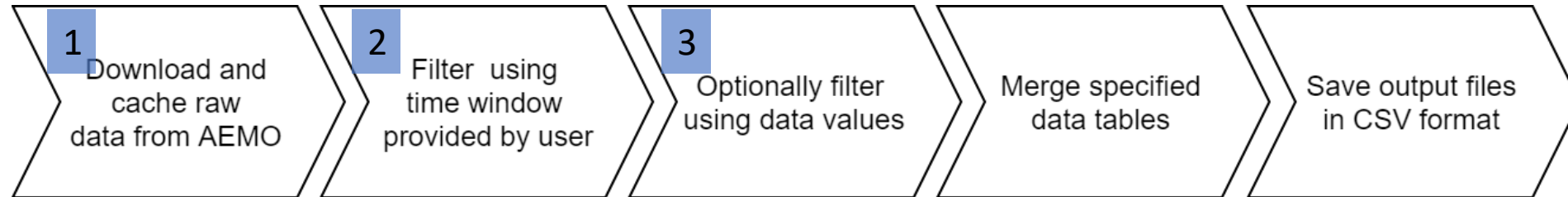
Accessing an AEMO data table



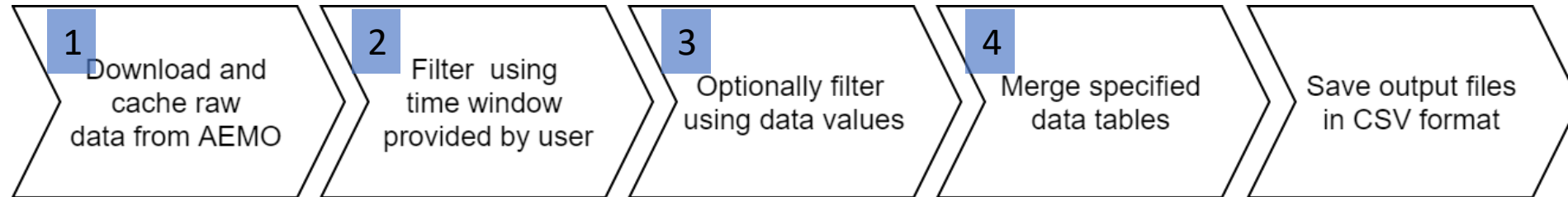
Accessing an AEMO data table



Accessing an AEMO data table



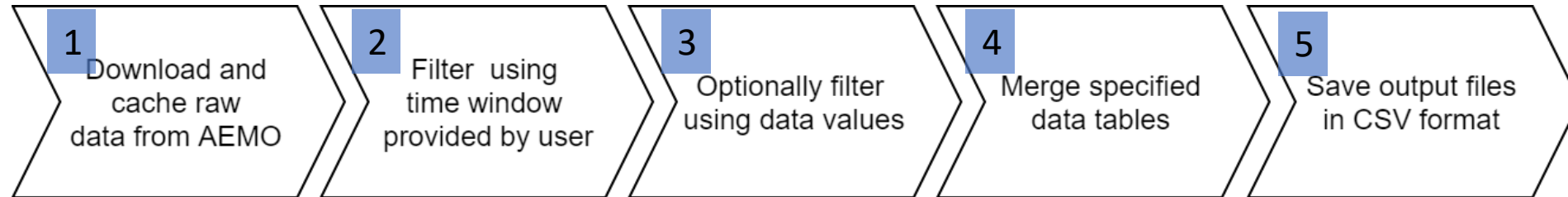
Accessing an AEMO data table



The screenshot shows the NEMOSIS software interface with the following configuration:

- Output data to:** [Empty field]
- Raw data cache:** [Empty field] (labeled with a blue '1')
- Query name:** [Empty field]
- Start time:** (YYYY/MM/DD HH:MM:SS) [Empty field] (labeled with a blue '2')
- End time:** (YYYY/MM/DD HH:MM:SS) [Empty field] (labeled with a blue '2')
- Select table:** A list of tables with **DISPATCHLOAD** selected.
- Select columns:** A list of columns with **SETTLEMENTDATE** and **INTERVENTION** selected.
- Select DUIDs:** [Empty field] (labeled with a blue '3')
- Select INTERVENTIONS:** [Empty field]
- Buttons:** + AEMO table, + Custom table, + Merge (labeled with a blue '4'), Run queries
- Session Management:** Save session, Load session

Accessing an AEMO data table



The screenshot shows the NEMOSIS software interface with the following elements and numbered callouts:

- Output data to:** A text field with a blue callout **5**.
- Raw data cache:** A text field with a blue callout **1**.
- Query name:** A text field.
- Start time:** A text field with format (YYYY/MM/DD HH:MM:SS) and a blue callout **2**.
- End time:** A text field with format (YYYY/MM/DD HH:MM:SS) and a blue callout **2**.
- Select table:** A list box containing tables such as DISPATCHLOAD, DUDETAILSUMMARY, DUDETAIL, DISPATCHCONSTRAINT, GENCONDATA, DISPATCH_UNIT_SCADA, DISPATCHPRICE, SPDREGIONCONSTRAINT, SPDCONNECTIONPOINTCONSTRAINT, and SPDINTERCONNECTORCONSTRAINT. DISPATCHLOAD is selected.
- Select columns:** A list box containing columns such as SETTLEMENTDATE, DUID, INTERVENTION, DISPATCHMODE, AGCSTATUS, INITIALMW, TOTALCLEARED, RAMPDOWNRATE, RAMPUPRATE, and LOWER5MIN. SETTLEMENTDATE and INTERVENTION are selected.
- Select DUIDs:** A text field with a blue callout **3**.
- Select INTERVENTIONS:** A text field.
- Buttons:** Save session, Load session, + AEMO table, + Custom table, + Merge, and Run queries.
- Callout 4:** A blue callout **4** is positioned below the + Merge button.

AEMO table: dispatch SCADA for Renewable generators

NEMOSIS

Output data to: ...

Raw data cache: ...

Unit SCADA

Query name:

Start time: (YYYY/MM/DD HH:MM:SS)

End time: (YYYY/MM/DD HH:MM:SS)

Select table:

- DISPATCHLOAD
- DUDETAILSUMMARY
- DUDETAIL
- DISPATCHCONSTRAINT
- GENCONDATA
- DISPATCH_UNIT_SCADA**
- DISPATCHPRICE
- SPDREGIONCONSTRAINT
- SPDCONNECTIONPOINTCONSTRAINT
- SPDINTERCONNECTORCONSTRAINT

Select columns:

- SETTLEMENTDATE
- DUID**
- SCADAVALUE

Select DUIDs:

Unit Fuel Type

Query name:

Start time: (YYYY/MM/DD HH:MM:SS)

End time: (YYYY/MM/DD HH:MM:SS)

Select table:

- BIDDAYOFFER_D
- DISPATCHREGIONSUM
- FCAS_4_SECOND
- ELEMENTS_FCAS_4_SECOND
- VARIABLES_FCAS_4_SECOND
- Generators and Scheduled Loads**
- TRADINGLOAD
- TRADINGPRICE
- TRADINGREGIONSUM
- TRADINGINTERCONNECT

Select columns:

- Region
- Dispatch Type
- Category
- Classification
- Fuel Source - Primary**
- Fuel Source - Descriptor
- Technology Type - Primary
- Technology Type - Descriptor
- Aggregation
- DUID**

Select DUIDs:

Select Fuel Source - Primarys:

- Solar
- Wind
- Hydro
- Renewable/ Biomass/ Waste

Merge data

Merge name:

Select join type:

- inner**
- left
- right

Left table:

Right table:

Left keys:

Right keys:

+ AEMO table + Custom table + Merge ▶ Run queries



AEMO table: dispatch SCADA for Renewable generators

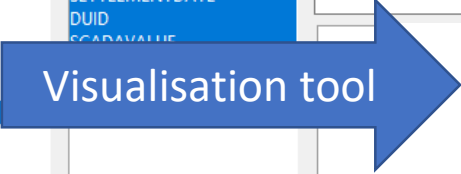
NEMOSIS

Output data to: Save session

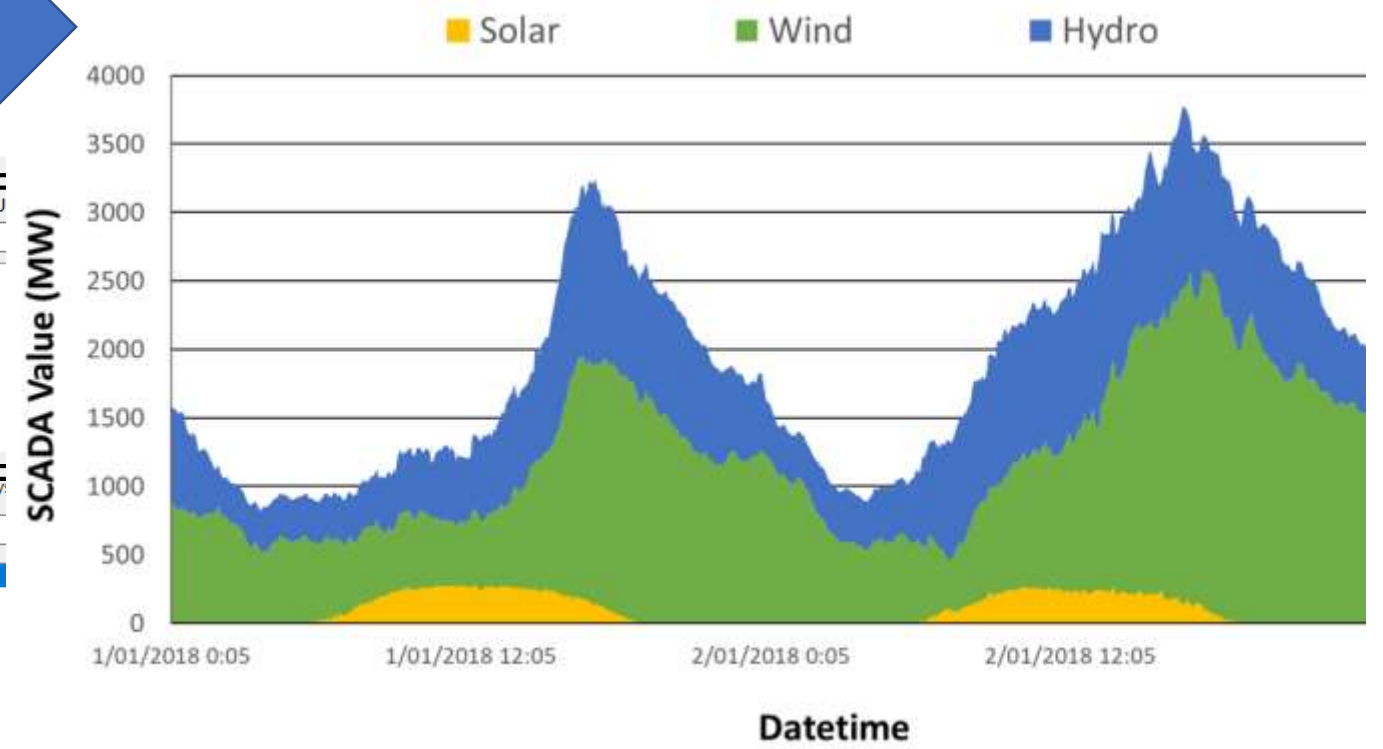
Raw data cache: Load session

Unit SCADA	Query name: <input type="text" value="unit_dispatch_data"/> Start time: (YYYY/MM/DD HH:MM:SS) <input type="text" value="2018/01/01 00:00:00"/> End time: (YYYY/MM/DD HH:MM:SS) <input type="text" value="2018/01/03 00:00:00"/>	Select table: DISPATCHLOAD DUDETAILSUMMARY DUDETAIL DISPATCHCONSTRAINT GENCONDATA DISPATCH_UNIT_SCADA DISPATCHPRICE SPDREGIONCONSTRAINT SPDCONNECTIONPOINTCONSTRAINT SPDINTERCONNECTORCONSTRAINT	Select columns: SETTLEMENTDATE DUID SCADAValue	Select DUIDs: <input type="text"/>
Unit Fuel Type	Query name: <input type="text" value="unit_fuel_types"/> Start time: (YYYY/MM/DD HH:MM:SS) <input type="text"/> End time: (YYYY/MM/DD HH:MM:SS) <input type="text"/>	Select table: BIDDAYOFFER_D DISPATCHREGIONSUM FCAS_4_SECOND ELEMENTS_FCAS_4_SECOND VARIABLES_FCAS_4_SECOND Generators and Scheduled Loads TRADINGLOAD TRADINGPRICE TRADINGREGIONSUM TRADINGINTERCONNECT	Select columns: Region Dispatch Type Category Classification Fuel Source - Primary Fuel Source - Descriptor Technology Type - Primary Technology Type - Descriptor Aggregation DUID	Select DUIDs: <input type="text"/>
Merge data	Merge name: <input type="text" value="dispatch_and_fuel_types"/> Left table: <input type="text" value="unit_dispatch_scada"/> Right table: <input type="text" value="unit_fuel_types"/>	Select join type: inner left right	Left key: <input type="text" value="DUID"/>	Right key: <input type="text" value="DUID"/>

+ AEMO table + Custom table + Merge ▶ Run queries



Visualisation tool



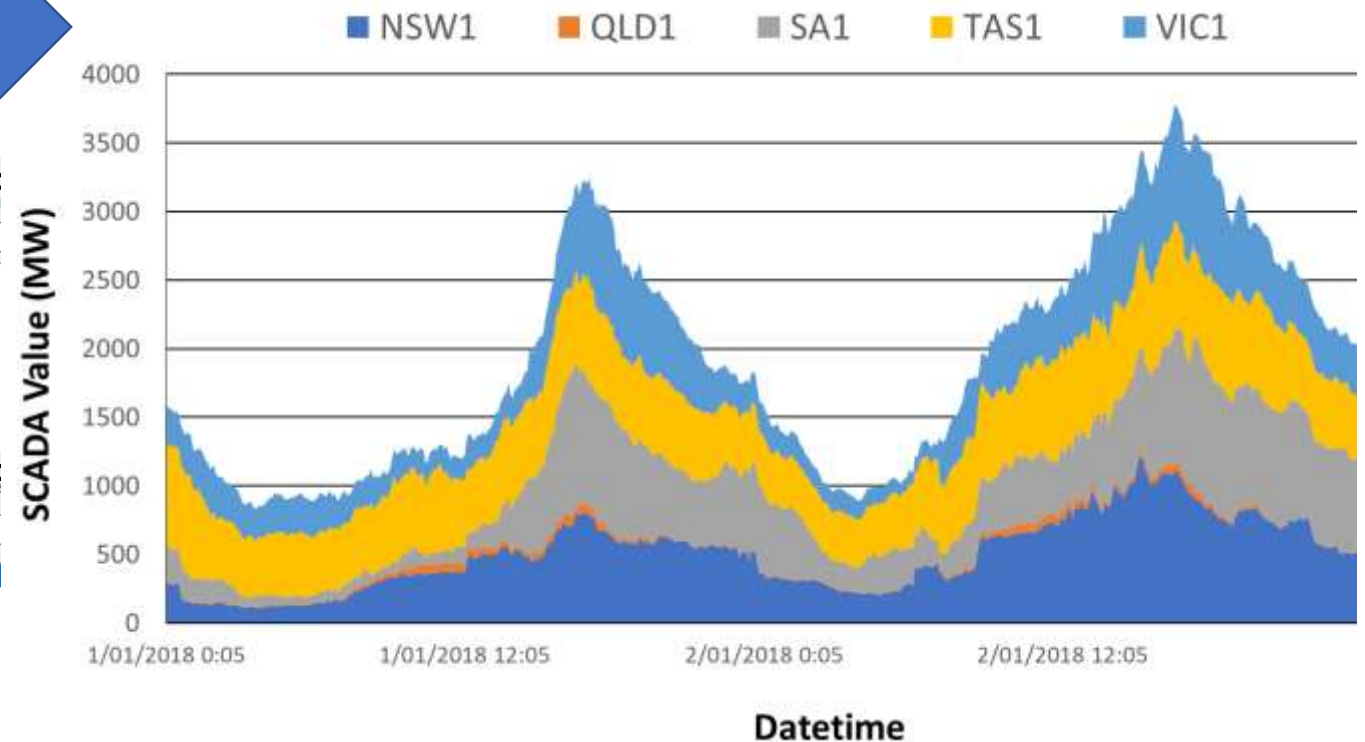
AEMO table: dispatch SCADA for Renewable generators

NEMOSIS

Output data to: E:/raw_aemo_data ... Save session
 Raw data cache: C:/Users/user/Desktop ... Load session

Unit SCADA	Query name: <input type="text" value="unit_dispatch_data"/> Start time: (YYYY/MM/DD HH:MM:SS) <input type="text" value="2018/01/01 00:00:00"/> End time: (YYYY/MM/DD HH:MM:SS) <input type="text" value="2018/01/03 00:00:00"/>	Select table: DISPATCHLOAD DUDETAILSUMMARY DUDETAIL DISPATCHCONSTRAINT GENCONDATA DISPATCH_UNIT_SCADA DISPATCHPRICE SPDREGIONCONSTRAINT SPDCONNECTIONPOINTCONSTRAINT SPDINTERCONNECTORCONSTRAINT	Select columns: SETTLEMENTDATE DUID SCADAValue	
Unit Fuel Type	Query name: <input type="text" value="unit_fuel_types"/> Start time: (YYYY/MM/DD HH:MM:SS) <input type="text"/> End time: (YYYY/MM/DD HH:MM:SS) <input type="text"/>	Select table: BIDDAYOFFER_D DISPATCHREGIONSUM FCAS_4_SECOND ELEMENTS_FCAS_4_SECOND VARIABLES_FCAS_4_SECOND Generators and Scheduled Loads TRADINGLOAD TRADINGPRICE TRADINGREGIONSUM TRADINGINTERCONNECT	Select columns: Region Dispatch Type Category Classification Fuel Source - Primary Fuel Source - Descriptor Technology Type - Primary Technology Type - Descriptor Aggregation DUID	
Merge data	Merge name: <input type="text" value="dispatch_and_fuel_types"/> Left table: <input type="text" value="unit_dispatch_scada"/> Right table: <input type="text" value="unit_fuel_types"/>	Select join type: inner left right	Left keys: <input type="text" value="DUID"/> Right keys: <input type="text" value="DUID"/>	

+ AEMO table + Custom table + Merge Run queries



Custom table: Plant Stats

Custom table

NEMOSIS

Output data to: ...

Raw data cache: ...

Query name:	Select table:	Select columns:	Select DUIDs:	
<input type="text" value="plant_stats"/>	FCAS_4s_SCADA_MAP PLANTSTATS	Month DUID CapacityFactor Volume TRADING_VWAP DISPATCH_VWAP NodalPeakCapacityFactor Nodal90thPercentileCapacityFactor		<input type="button" value="X"/>
Start time: (YYYY/MM/DD HH:MM:SS)				
<input type="text" value="2017/07/01 00:00:00"/>				
End time: (YYYY/MM/DD HH:MM:SS)				
<input type="text" value="2018/07/01 00:00:00"/>				

Query name:	Select table:	Select columns:	Select DUIDs:	Select Fuel Source - Primaries:
<input type="text" value="plant_fuel_types"/>	BIDDAYOFFER_D DISPATCHREGIONSUM FCAS_4_SECOND ELEMENTS_FCAS_4_SECOND VARIABLES_FCAS_4_SECOND Generators and Scheduled Loads TRADINGLOAD TRADINGPRICE TRADINGREGIONSUM TRADINGINTERCONNECT	Region Dispatch Type Category Classification Fuel Source - Primary Fuel Source - Descriptor Technology Type - Primary Technology Type - Descriptor Aggregation DUID		
Start time: (YYYY/MM/DD HH:MM:SS)				
<input type="text"/>				
End time: (YYYY/MM/DD HH:MM:SS)				
<input type="text"/>				

Merge name	Select join type	Left keys	Right keys
<input type="text" value="stats_and_fuel_type"/>	inner left right		
Left table			
<input type="text" value="plant_stats"/>		DUID	DUID
Right table			
<input type="text" value="plant_fuel_types"/>			



Custom table: Plant Stats

Output data to: C:\Users\A\Data
Save session

Raw data cache: E:\raw_aemo_data
Load session

Custom
table

Query name:	Select table:	Select columns:	Select DUIDs:
plant_stats	FCAS_4s_SCADA_MAP PLANTSTATS	Month DUID CapacityFactor Volume TRADING_VWAP DISPATCH_VWAP NodalPeakCapacityFactor Nodal90thPercentileCapaci	
Start time: (YYYY/MM/DD HH:MM:SS)			
2017/07/01 00:00:00			
End time: (YYYY/MM/DD HH:MM:SS)			
2018/07/01 00:00:00			

Custom
table

Query name:	Select table:	Select columns:	Select DUIDs:
plant_fuel_types	BIDDAYOFFER D DISPATCH FCAS_4 ELEMEN VARIABLES Generators and Scheduled Loads	Region Fuel Source - Descripto Technology Type - Primary Technology Type - Descript Aggregation DUID	
Start time: (YYYY/MM/DD HH:MM:SS)			
End time: (YYYY/MM/DD HH:MM:SS)			
Merge name	Select join type	Left keys	
stats_and_fuel_type	inner left right	DUID	
Left table			
plant_stats			
Right table			
plant_fuel_types			

➔ Visualisation tool

Average Solar Generator Capacity Factor

■ Capacity Factor
 ■ 90th Percentile Capacity Factor
 ■ Peak Capacity Factor

+ AEMO table
+ Custom table
+ Merge
Run queries

What other data is in the tool?

- Dispatch targets
- FCAS enablement values
- Interconnector flows
- Energy and FCAS prices
- More generator information
- Regional demand and generation summaries
- Four second FCAS SCADA data
- Generator and Load bidding data
- FCAS trapezium constraints

Use the source code

pip install nemosis

```
from nemosis import data_fetch_methods

start_time = '2017/01/01 00:00:00'
end_time = '2017/01/01 00:05:00'
table = 'DISPATCHPRICE'
raw_data_cache = 'C:/Users/your_data_storage'

price_data = data_fetch_methods.dynamic_data_compiler(start_time, end_time, table, raw_data_cache)
```

More info:

- Download the tool: <https://github.com/UNSW-CEEM/NEMOSIS/releases>
- Read the conference paper
- Checkout the Wiki: <https://github.com/UNSW-CEEM/NEMOSIS/wiki>
- Ask questions and get updates, join the forum group:
<https://groups.google.com/forum/#!forum/nemosis-discuss>

AEMO table: dispatch SCADA for Renewable generators

NEMOSIS

Output data to: E:/raw_aemo_data ... Save session
 Raw data cache: C:/Users/user/Desktop ... Load session

Unit SCADA	Query name: unit_dispatch_data Start time: (YYYY/MM/DD HH:MM:SS) 2018/01/01 00:00:00 End time: (YYYY/MM/DD HH:MM:SS) 2018/01/03 00:00:00	Select table: DISPATCHLOAD DUDETAILSUMMARY DUDETAIL DISPATCHCONSTRAINT GENCONDATA DISPATCH_UNIT_SCADA DISPATCHPRICE SPDREGIONCONSTRAINT SPDCONNECTIONPOINTCONSTRAINT SPDINTERCONNECTORCONSTRAINT	Select columns: SETTLEMENTDATE DUID SCADAValue	Select DUIDs:
Unit Fuel Type	Query name: unit_fuel_types Start time: (YYYY/MM/DD HH:MM:SS) End time: (YYYY/MM/DD HH:MM:SS) 	Select table: BIDDAYOFFER_D DISPATCHREGIONSUM FCAS_4_SECOND ELEMENTS_FCAS_4_SECOND VARIABLES_FCAS_4_SECOND Generators and Scheduled Loads TRADINGLOAD TRADINGPRICE TRADINGREGIONSUM TRADINGINTERCONNECT	Select columns: Region Dispatch Type Category Classification Fuel Source - Primary Fuel Source - Descriptor Technology Type - Primary Technology Type - Descriptor Aggregation DUID	Select DUIDs:
Merge data	Merge name: dispatch_and_fuel_types Left table: unit_dispatch_scada Right table: unit_fuel_types	Select join type: inner left right	Left keys: DUID	Right keys: DUID

+ AEMO table + Custom table + Merge ▶ Run queries

Visualisation tool →

