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Enabling consumer energy resources in our electricity grids

Findings and recommendations so far from the CER Enablement Project


☺ or ☹ ?

FIRST PROJECT (2019–20)

What are all the technical issues associated with excess solar exports?

+

What are all the techniques available to manage them? (and how much do they cost?)

=

What are the most cost-effective ways to enable more CER without stuffing up the grid?

Funded by Energy Consumers Australia
Technical work by Energeia

FIRST PROJECT (2019–20)

Findings:

Tap changes and load control
get us there for a while…

…but not everywhere, and not for so long

More sophisticated system-wide and
forward-looking modelling is needed
to map the whole suite of approaches
– technical, policy, regulatory, and market –
needed to reach a future where DER
penetration is at the optimal level
for maximum consumer benefit
in a safe, secure and reliable grid.

Second project (2020–21)

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A modelling and analysis project

- Funded by Energy Consumers Australia
- Technical work by Energeia
- Peer review by CutlerMerz

Three stages

- Iterative modelling to find the optimal future state
  - *based on findings of the first project*
- Identifying what's needed to attain that state
  - *and what the barriers are*
- Prioritising future advocacy
  - *which barriers need the most attention*

The *Consumer High DER* scenario

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An ideal scenario, not a forecast

By estimating the size of the prize without considering the associated barriers, it can be used to inform decision-making regarding the prioritisation of any policy, regulatory, industry and institutional reforms needed to [overcome these barriers and] achieve the identified optimal levels of [CER] investment.

It shows what's possible

- 127 GW rooftop solar in 2050
  - *Up from 20 GW today*
- 136 GWh BTM battery storage
  - *Up from 1.4 GWh today*

$25b net benefit by 2035

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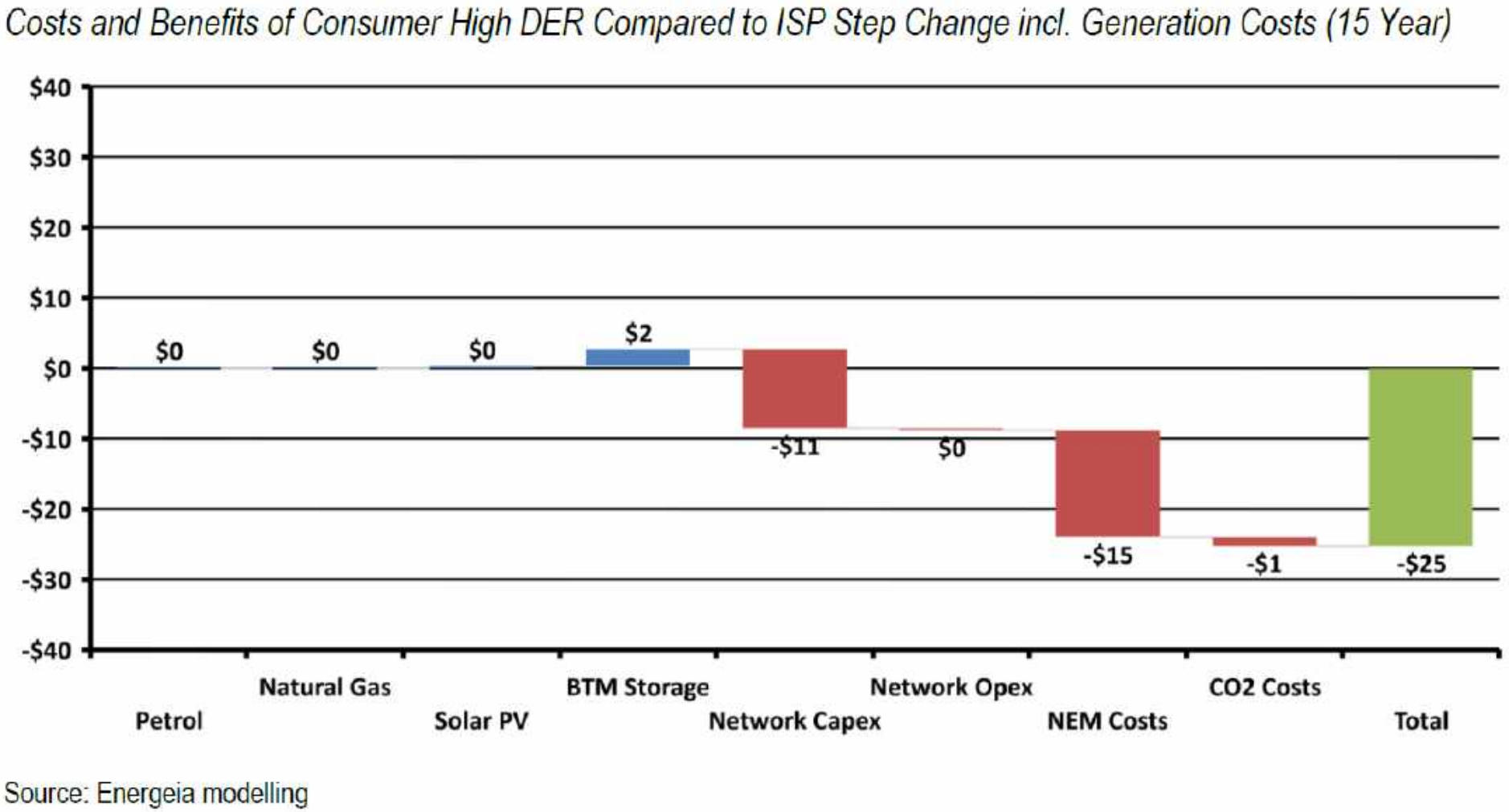
Compared to Step Change scenario from 2020 ISP



Source: Energeia modelling

$69b net benefit by 2050

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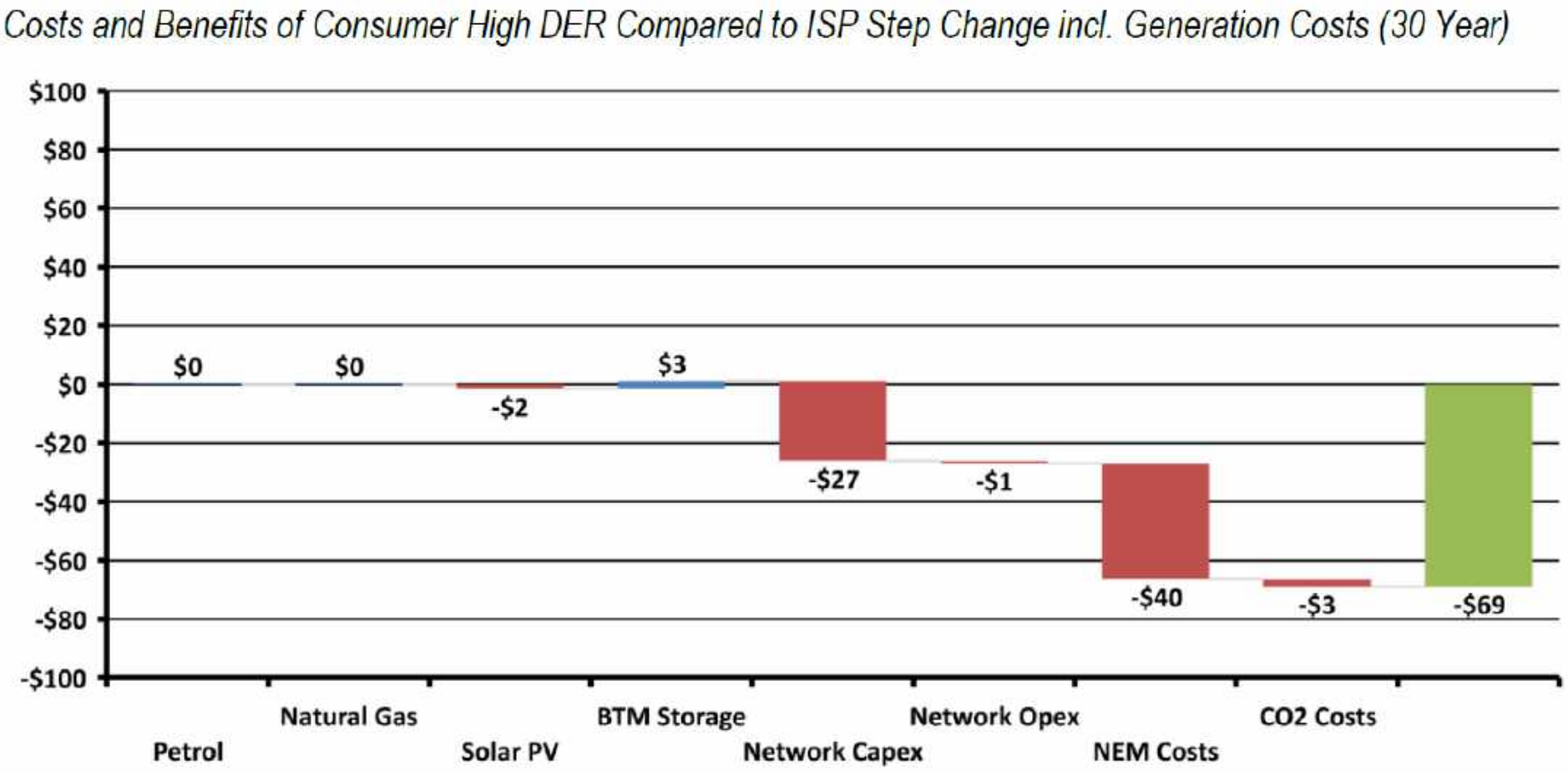
Compared to Step Change scenario from 2020 ISP



Source: Energeia modelling

What the future looks like

- Optimal CER adoption rate is less than the current rate, but increases over time
- Distribution and transmission capacity requirements reduced by 23%.
- Significant curtailment of solar PV and wind occurs, but solar exports still valuable.
- Spot prices increasingly negative when solar PV generation is high.
- Orchestrated CER plays a major role in shifting load to minimize curtailment of solar exports.
- Annual NEM consumption declines from 2036 as coal exits, reducing solar curtailment.
- Enabling VPPs for reliability and security supports timely exit of aged generation.

Overcoming the barriers

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Levelling the playing field

- **Accurate network price signals** nodal and dynamic price signals to properly value CER (import, export, LuoS tariffs
- **Fully recognizing the network value of CER** right down to the LV level (expand the RIT-D?)

Enabling CER management and deployment

- **Holistic and transparent distribution planning** in the LV and HV network to maximise opportunities for active CER to support network operations
- **CER management systems** – standards, interoperability to maximise opportunities for orchestration balancing network and market services

Overhauling regulatory incentives

- **Delinking network investment from DNSP valuations** – reforming incentive schemes, linking shareholder returns to network user outcomes

Next steps

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Fine-tuning the recommendations

- Further stakeholder engagement
- Have we got it right? Have we missed anything?

Advocacy priorities

- Where is targeted advocacy most needed?
- What is already happening OK?

Future and parallel work?

- Is there any area that needs more research, modelling, analysis, etc.?
- What parallel work is needed to complement this CER enablement agenda (e.g. housing and appliance standards?)

The consumer model

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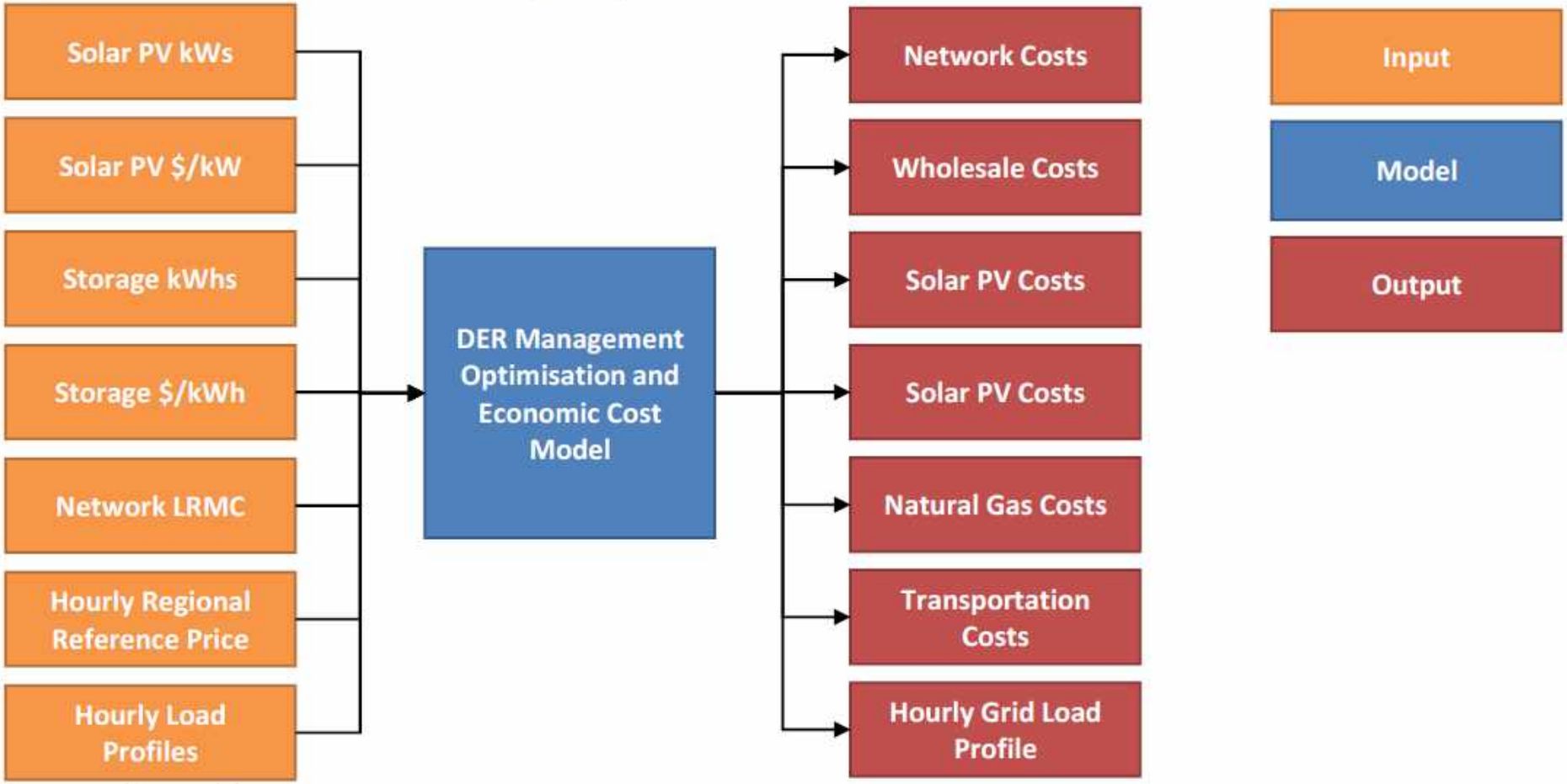
Figure 5 – Consumer Modelling Diagram



Source: Energeia

The wholesale market model

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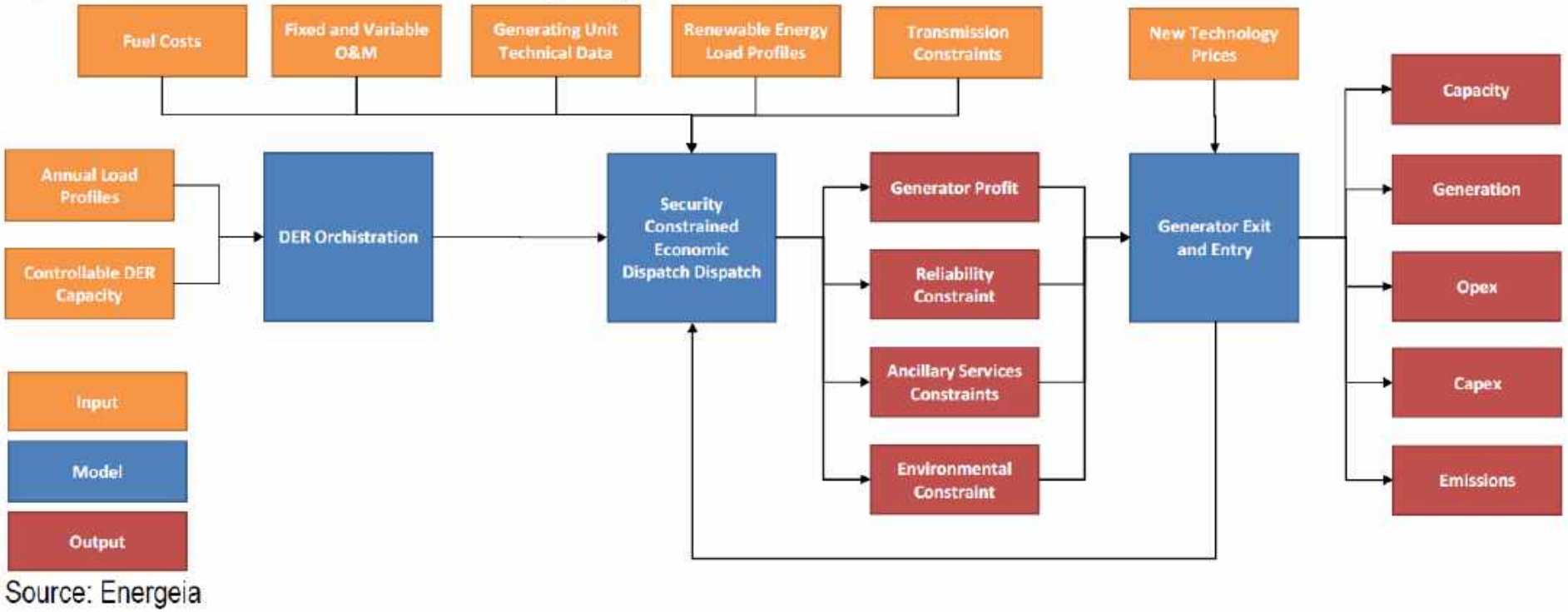
Figure 19 – Wholesale Market Modelling Diagram



Source: Energeia

Renew's vision is to create a world in which communities thrive in a way that does not cost the earth.

Our strategic objectives are built on more than 38 years of knowledge on sustainable housing, networks in the building sector and expertise in market advocacy.

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