

Take Charge

Foresighting Forum 2021

The Digital Series.



Framing the future by learning from the shocks of 2020

WORLD SOLAR CHALLENGE NEXT 3000 KM



**BEWARE
KANGAROOS**



**DRIVE ON LEFT
IN AUSTRALIA**



**SOLAR POWER
ONLY**

**How can we see
3 million roofs
producing solar
energy as an
opportunity to
seize rather
than a problem
to manage?**



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WEBINAR ONE:

SOCIAL PRACTICE AND CONSUMER BEHAVIOUR

How is COVID changing energy use and what does it imply about the challenge of forecasting?

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WEBINAR TWO:

SYSTEM RESILIENCE

How are consumers and networks responding to bushfires and how should can we adapt to a changing climate?

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WEBINAR THREE:

SYSTEM DESIGN

How do we design an electricity system that is future and consumer focused?

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System Design

Online Webinar

Tuesday September 7, 10.30am - 12.00pm



Dr Andrew Nance
Director, The Energy
Project Pty Ltd



Mark Byrne
Energy Market Advocate,
Total Environment Centre



Brian Spak
Director, Energy System
Transition, Energy
Consumers Australia



Lynne Gallagher
CEO, Energy Consumers
Australia



Get Involved

How do we better incorporate consumers' values, needs, and expectations into system design and planning?

#TakeCharge21



Energy Consumers Australia Energyconsumersaustralia energyvoiceau

Or email us info@energyconsumersaustralia.com.au

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Framing the Future: System Design

The Godfather on System Design: Enlarge System Boundaries



Amory Lovins
@AmoryLovins



“If a problem cannot be solved, enlarge it.” —President Eisenhower Most try to make tough problems solvable by chopping them up into smaller pieces. But this sacrifices the design space we need to consider options, degrees of freedom, synergies. Enlarge your systems’ boundaries.



Matt Eggers 🇺🇸 🌳 🌍 💡

@EggersMatt



What crazy stuff will you do when you have power for \$0.01/kWh? We should be having dozens of engineering hackathons on this idea. It may be as equally transformative as cheap computing power has been. It is time to build - particularly stuff that uses (almost) free solar power.

5:17 AM · May 15, 2020 · Twitter Web App

How quickly the world can change...

Easter morning 1900: 5th Ave, New York City. Spot the automobile.



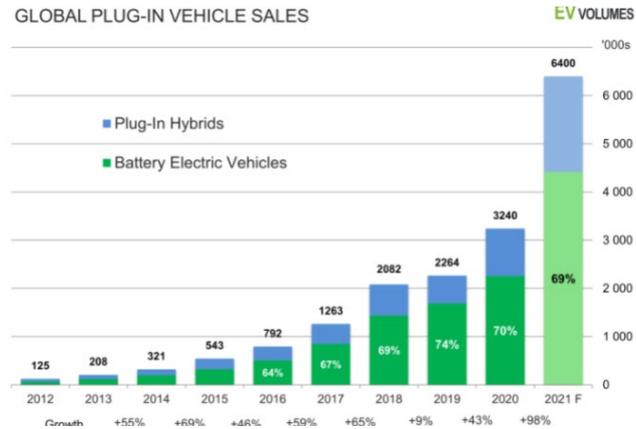
Source: US National Archives.

Easter morning 1913: 5th Ave, New York City. Spot the horse.



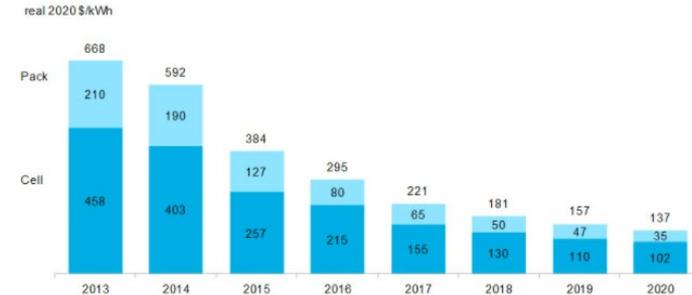
Source: George Grantham Bain Collection.

Electric vehicles: when, not if...



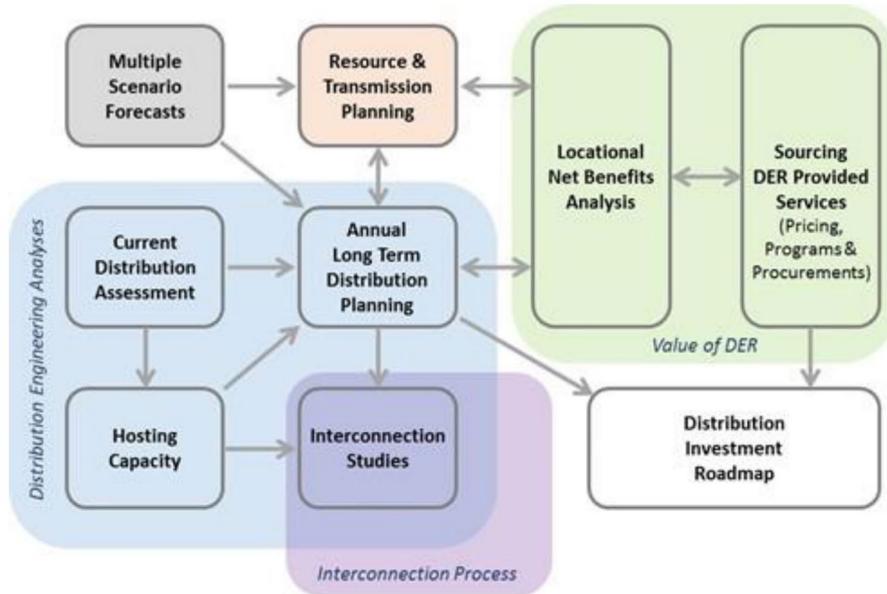
Global EV Sales for 2021 H1, <https://www.ev-volumes.com/>

Volume-weighted average battery pack and cell prices for EVs



BloombergNEF, Battery Pack Prices Cited Below \$100/kWh for the First Time in 2020, While Market Average Sits at \$137/kWh, Dec 2020

New Tools to Integrate the Distribution System into Transmission (ISP) Planning



“Updates to the distribution planning process [through a standardized planning framework] will be needed to support a reliable, efficient, robust grid in a changing (and uncertain) future; should be coordinated with resource and transmission planning; could incorporate stakeholder informed planning scenarios.” – Minnesota Public Utility Commissioner Nancy Lange, 2015

Source: Integrated Distribution Planning, U.S. Department of Energy (DOE) developed at the request of the Minnesota Public Utilities Commission (MPUC)

Mark Byrne
Energy Market Advocate





Energy Consumers Australia Foresighting Forum System Design Webinar

Dr Andrew Nance
ISP Consumer Panel
7th September 2021

A little bit of History ...

- Various approaches to state-run electricity systems appear over the 20th century
- National Electricity Market (NEM) kicks off in 1998
- Mandatory Renewable Energy Target kicks off in 2001
- Jurisdictions introduce feed-in tariffs for roof top solar from 2008
- The cost of solar and wind energy falls (and a lot gets connected) in the 2010's
- South Australia suffers a state-wide power outage in September 2016
- Outbreak of blame and opinion triggers a review of the NEM – the Finkel Review
- The Integrated System Plan (ISP) is created from the Finkel Review recommendation for an “integrated grid plan” (Recommendations 5.1-5.3 Improved system planning) in July 2017

System Planning

- ISP is updated every 2 years by AEMO and recommends an Optimal Development Path and Actionable Projects worth tens of billions of \$ in network and power system investments
- ISP Consumer Panel appointed in November 2020 to promote the **consumer interest**
- Given the high speed and \$ impact of the energy transition we think this is most likely to happen if the ISP can:
 - Continuously **improve accuracy** of forecasts AND
 - **Manage uncertainty** in order to develop a power system that is robust to a range of possible futures AND
 - Capture the benefits of **good engagement**: Inform consumers and other stakeholders on what the ISP means for them - take a NEM-wide plan to a local and sector specific context so that local and domain expertise can be channelled back to each iteration of the plan.

Figure 3 Optimal development path



Planning for ... ?

- **Scenario** analysis and sensitivity testing of the Cost-Benefit-Analysis for development paths are the main ways used to manage uncertainty – want it to be “robust” to range of possible futures
- Key forecasting challenge is understanding consumer demand in 2030, 2040 and beyond. Impacted by the uptake of ‘**customer owned**’ energy resources (aka solar and batteries, electric vehicles etc) and “the electrification of everything” ...
- But “everything” always has a **local** context ... Can a single “whole of system plan” integrate what’s happening at the local level?
- What happens when ‘**customer owned**’ energy dominates the local networks? Local “System Operators” will need local system plans and these will need to be consistent with the ISP and how AEMO operates the NEM ... will bottom up meet top down?
- Is “the electrification of everything” our chance to pivot to a different approach?



Question & Answer

Drop your questions to our panelists in the Q&A tab on Zoom



Let us know

How do we better incorporate consumers' values, needs, and expectations into system design and planning?

Email us at info@energyconsumersaustralia.com.au or join in the conversation on LinkedIn, Twitter or Facebook.

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Upcoming

Foresighting Forum 2022

February 2022

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Thank you