NATIONAL ENERGY STRATEGY: ENERGY TRANSITION PLAN TO 2040

PROPOSED SCOPE

July 2017

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

CONTEXT

- Historically produced sequential NEFR, ESOO, NGFR, NTNDP, GSOO
- Need to integrate electricity and gas modelling
  - Holistic view on requirements at a snapshot in time
- Finkel review
- Analysis for Commonwealth Government
- Need to collaborate with industry to deliver a coordinate National strategy

2017 NATIONAL ENERGY STRATEGY: ENERGY TRANSITION PLAN TO 2040

Governing theme

DELIVERING CONTINUED ENERGY RELIABILITY AND SECURITY DURING THE ENERGY TRANSITION

Where are we now?

- What are expected supply shortfalls without new development – 10 years
- Identify shortfalls that **must** be met over the next 10 years
- What are the material issues/uncertainties facing the industry today?

Where are we going?

- What development is **required** the next 10 years (new generation and RIT-Ts)
- Identify credible long term planning pathways to deliver on 4 pillars throughout the energy transition: security, reliability, rewarding consumers and lowering emissions
- How material is investment risk if demand is lower than expected, or how quickly could new developments be required if the transition accelerates quicker than expected?

How are we going to get there?

- How can market structures incentivise investment and divestment required in planning pathways?
- What are our recommendations for action in next 2, 5, 10 years?

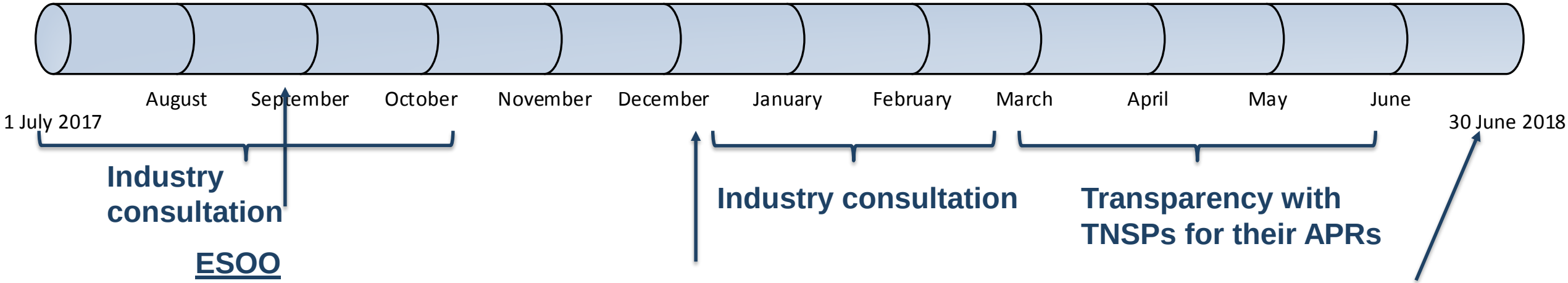
Medium Term (to 2027)

Long Term (to 2040)

Scenarios

- 4 scenarios: Neutral, Optimised DER, Low Grid Demand, Accelerated Transition

PROPOSED ESO/NES PROGRAM OF WORK



ESOO

- Electricity supply adequacy
- Assessing varying levels of dispatchable generation
- 10 years

Preliminary NES

- Preliminary strategy to 2040
- Supporting technical papers
  - 2017 NTNDP
  - Potentially, updated Energy Supply Outlook (electricity, summer focus)

Deliver Finkel NES

- Final Strategy paper to 2040
- Supporting technical paper
  - 2018 electricity forecasts
  - Response to consultation

PURPOSE OF EACH NES

Preliminary NES (Dec 2017)

To present a preliminary NES for public consultation that will comprise:

- Where are we now?
- Where are we going?
  - Proposed generation outlooks
  - Proposed Renewable Energy Zones
  - Potential NEM development options identified for testing
- How will we get there?
  - Proposed strategic roadmap for Finkel implementation

Finkel NES (June 2018)

To deliver AEMO's National Energy Strategy and integrated grid plan per Finkel recommendation 5.1.

- Summary of consultation feedback
- Where are we going?
  - Detailed assessment of NEM development options to identify most efficient pathway.
  - Recommendations for RIT-Ts
- How will we get there?
  - Finalised roadmap of actions to implement National Energy Strategy

NES MODELLING APPROACH

Preliminary NES (Dec 2017)

1. Identify renewable energy zones (through consultation)
2. Project generation additions and withdrawals to 2040 for each scenario.
3. Identify different combinations of network and non-network developments across the NEM for testing (through consultation)
4. Publish possible development combinations in Preliminary NES

Finkel NES (June 2018)

5. Listen to feedback following Preliminary NES
6. Incorporate feedback into modelling program
7. Perform detailed modelling to test efficiency of different development combinations
8. Publish recommendations for most efficient way to deliver continued S&R during the energy transition

PROPOSED SCENARIOS

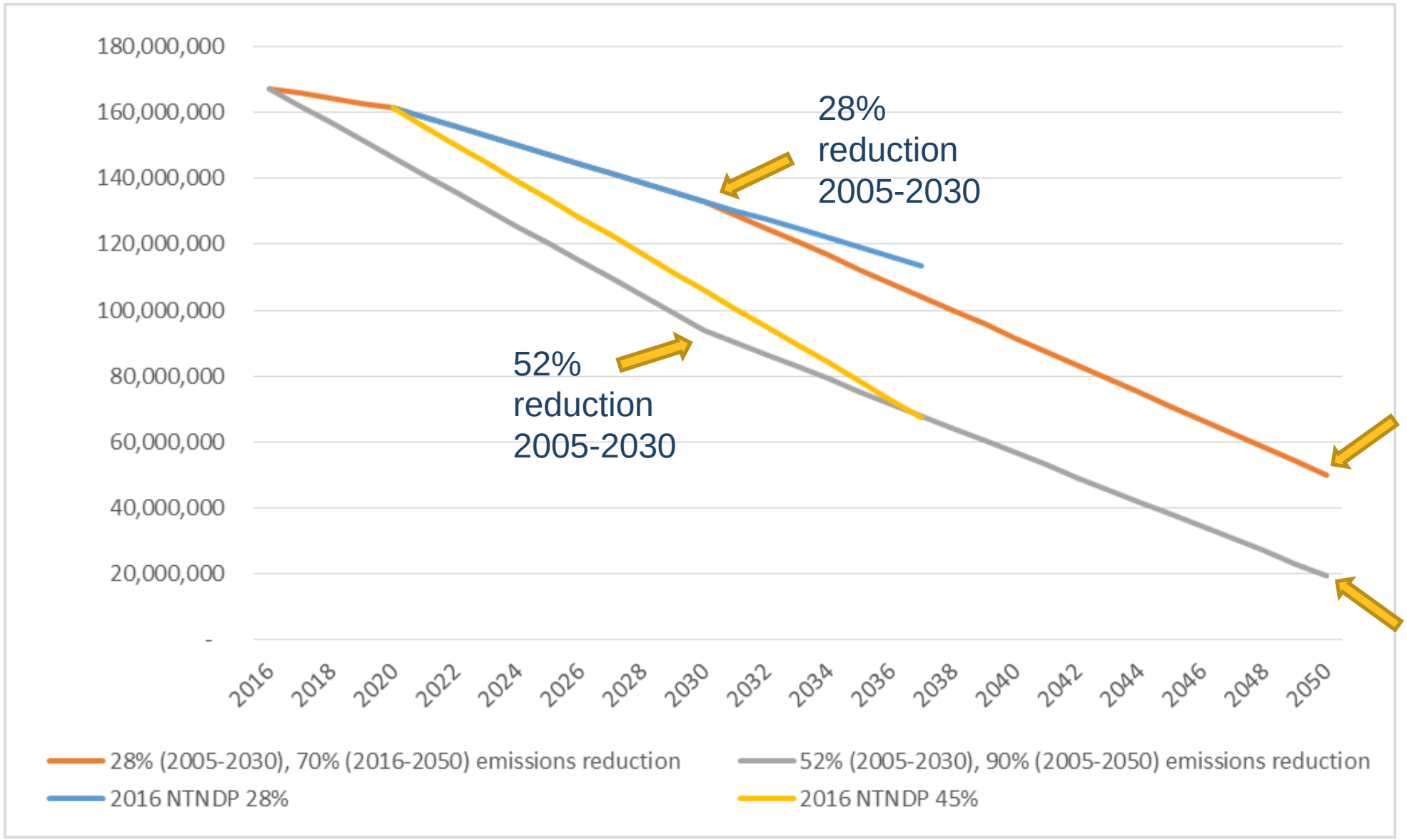
Key driver	Business as Usual	Optimised DER	Low Grid Demand	Accelerated Transition
Economy / energy demand levels	Neutral	Neutral	**Weak**	Neutral
DER(rooftop PV, dist. storage, DSP)	Neutral uptake	**High uptake**	**High uptake**	**High uptake**
Wind/PV/large-scale storage technology costs	Neutral cost reductions	Neutral cost reductions	Neutral cost reductions	**Rapid cost reductions**
Emissions reduction milestones	28% 2005-2030 70% 2016-2050	28% 2005-2030 70% 2016-2050	28% 2005-2030 70% 2016-2050	**52% 2005-2030** **90% 2005-2050** **(CSIRO)**
State/Federal RETs	LRET, VRET	LRET, VRET	LRET, VRET	LRET, VRET, **QRET**

IEA, March 2017 – "Limiting the global mean temperature rise to below 2°C with a probability of 66% would require energy-related CO2 emissions would need to peak before 2020 and fall by more than 70% from today's levels by 2050."

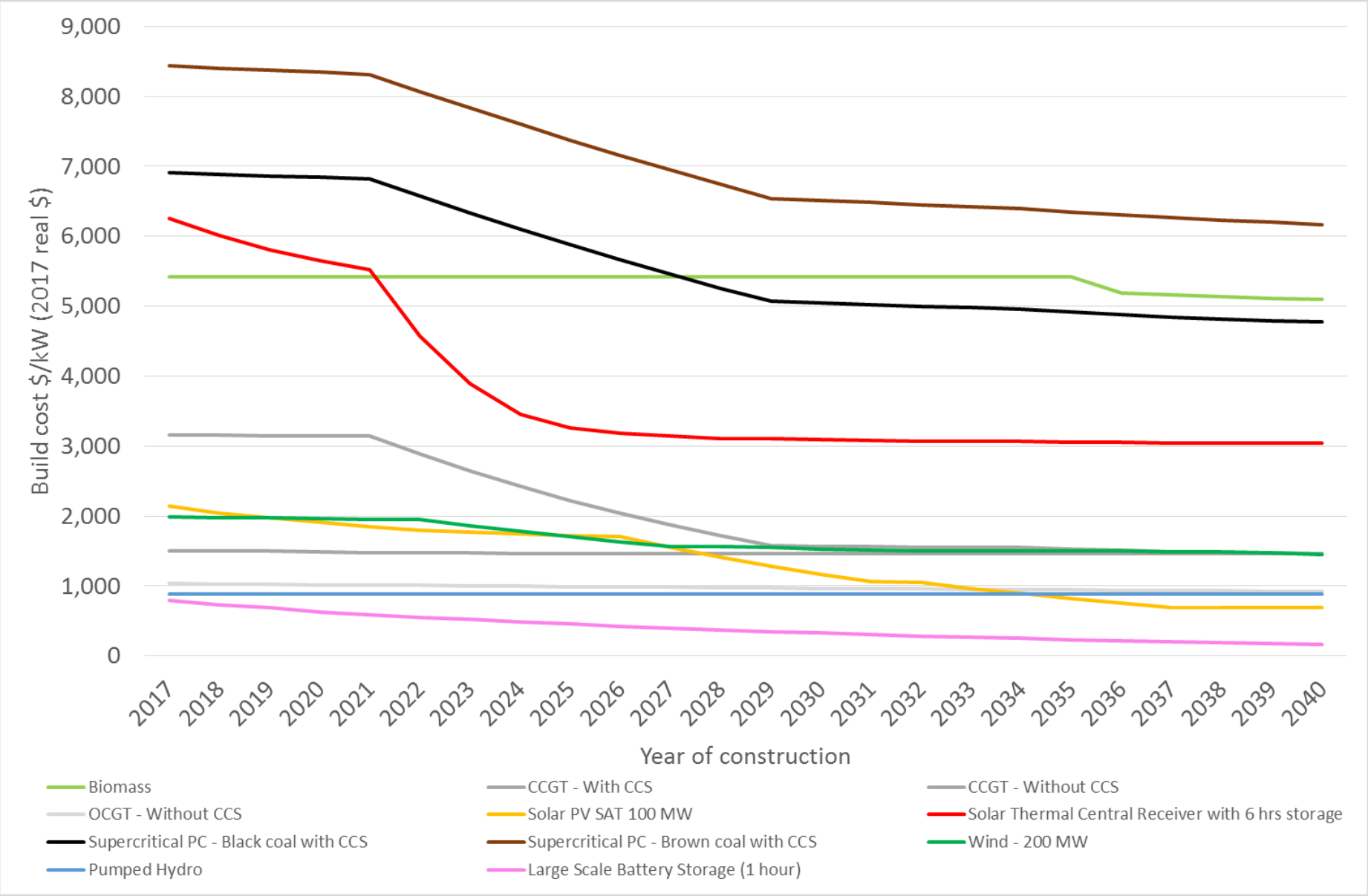
PURPOSE OF EACH SCENARIO

- **Business as usual** – base case expectations used for comparison.
- **Optimised DER** – examine the potential value of DER. Can optimising DER to meet system peaks reduce the need for large scale developments?
- **Low grid demand** – identify investment risk associated with new developments by examining whether they are needed if grid demand is extremely low.
- **Accelerated transition** – assess what new developments are required, and how quickly, if NEM emissions reductions and technological innovations advance quicker than currently expected.

EMISSIONS TRAJECTORY

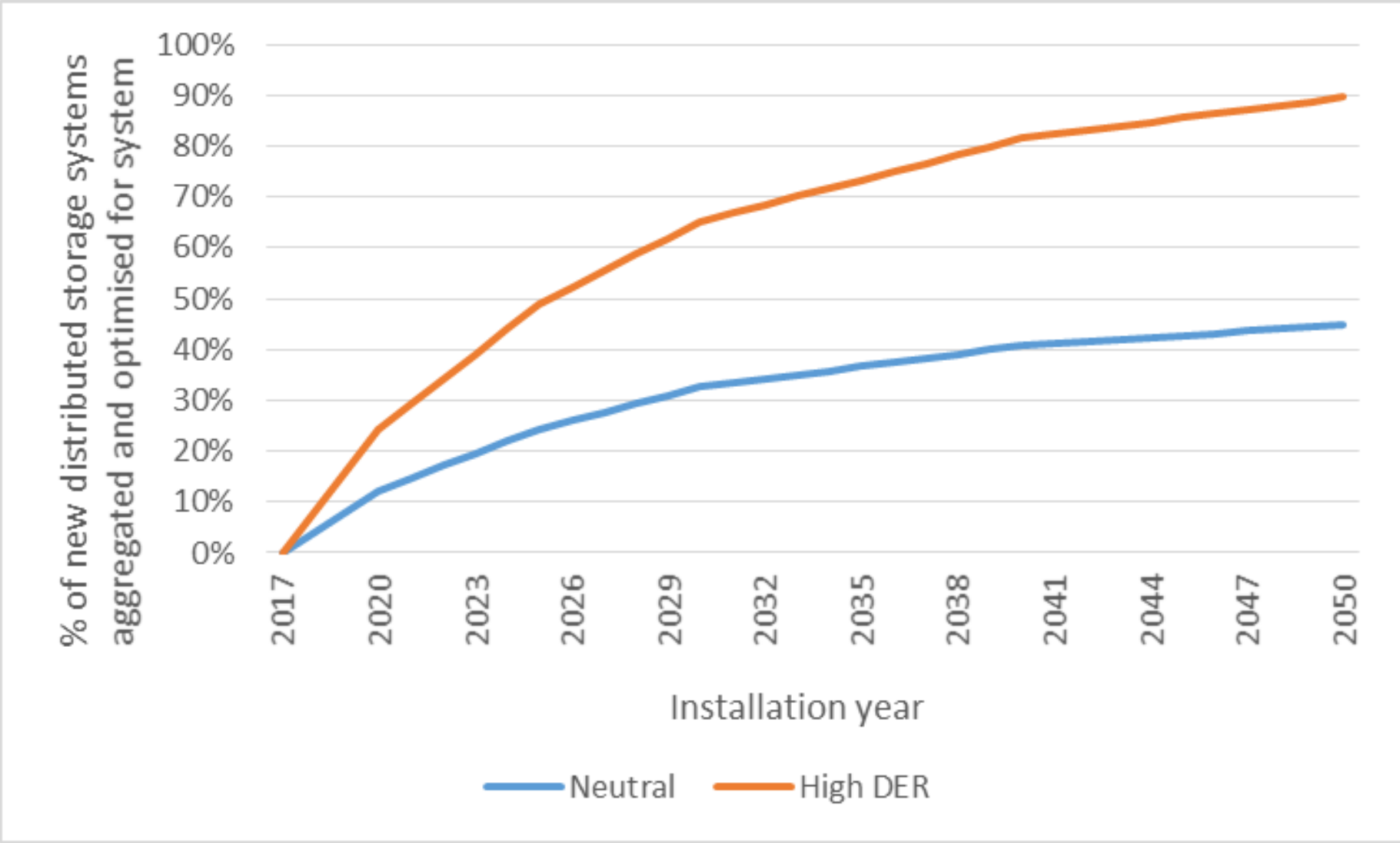


NEW GENERATION TECHNOLOGY COSTS



AGGREGATED DISTRIBUTED STORAGE

Percentage of new distributed storage systems aggregated and optimised to reduce system peaks



NEXT STEPS

- Monthly FPRG meetings
  - Progress updates
  - Discussion of key factors

- Direct stakeholder engagement:
  - Network service providers
  - Non-network service providers
  - Generators/developers
  - Consumer groups