

TCP – Demand Side Management

6th December 2018

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Our Objective

- *Introductions (10 min)*
- *What is the IEA Technology Collaboration Programs (20 min)*
 - Existing Work
 - Australian re-engagement (ExCo etc)
 - Australian activity in this sector (Monash and UNSW)
 - Relaunch of the TCP
 - Mission statement and objectives
- *Tasks (30 min)*
 - Peer to Peer Observatory
 - Behavioural Insights
 - Social Licence to Automate
- *Participation (How do I get involved?)(10min)*
 - IEA DSM-TCP Advisory Board
- *Discussion*

The IEA Technology Collaboration Programmes

IEA TECHNOLOGY COLLABORATION PROGRAMMES

- Cross-Cutting
- End-Use: Buildings
- End-Use: Electricity
- End-Use: Industry
- End-Use: Transport
- Fossil Fuels
- Fusion Power
- Renewable Energy



TECHNOLOGY COLLABORATION PROGRAMMES: HIGHLIGHTS AND OUTCOMES

The breadth of the analytical expertise in the IEA Technology Collaboration Programmes (TCPs) is a unique asset to the global transition to a cleaner energy future.

The year 2015 marked the 40th anniversary of these groups of experts. The IEA compendium book *Technology Collaboration Programmes: Highlights and Outcomes* is a collection of the significant recent outcomes of the 38 TCPs operating today, including updated statistics of participation worldwide.

To date, participants in the TCPs have examined around 2 000 energy-related topics, and carried out projects on socio-economic aspects of technology deployment, research to reduce greenhouse gas emissions, advancing demonstration of innovative energy technologies, contributing to benchmarks and international standards, and sharing information through hundreds of expert stakeholder events.

The TCPs involve over 6 000 experts worldwide who represent nearly 300 public and private organisations located in 55 countries, including a large participation by IEA Association countries, such as China, India and Brazil.

For more information

- [Frequently asked questions](#)
- [Current participants](#)
- [IEA Framework for International Energy Technology Co-operation](#)
- [List of IEA Technology Collaboration Programmes websites](#)

Multimedia

[Technology Collaboration Programmes introductory video](#)

Webinars

[Forthcoming and recent TCP webinars](#)

News & Events

[OPEN Energy Technology Bulletin](#)

[Joint IEA-EU workshop on electrofuels](#)

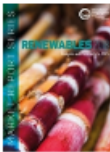
[Commentary: Progress with solar heat in India](#)

[Future energy market designs research and innovation needs](#)

[2nd Universal Meeting of IEA Technology Collaboration Programmes](#)

Related Publications

 [Tracking Clean Energy Progress 2018](#)

 [Renewables 2018](#)

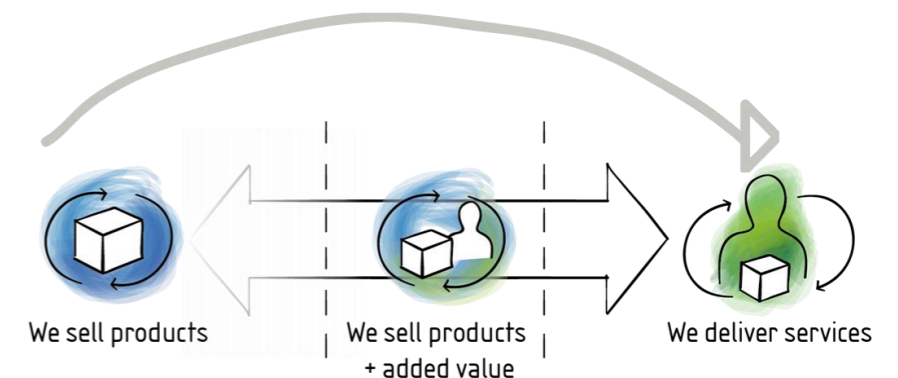
Great Work on DSM to Date

www.ieadsm.org

There have been 24 Tasks completed to date

Task 25– Business Models – Phase 2

The fields of energy efficiency, demand flexibility and renewable energy would benefit greatly from “servitisation”



In this phase key issues are

- Under which system conditions can an energy service flourish?
- What are the potentially conflicting system elements?
- What instruments or other means need adjustment to be of support?
- What new instruments or other means need to be developed?

Recent activity



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Welcome to IEA Demand Side Management Energy Efficiency Technology Collaboration Program (DSM TCP)

IEA Demand Side Management Energy Efficiency Technology Collaboration Program (DSM TCP) is an international collaboration of 16 countries and 3 sponsors working together to develop and promote opportunities for demand-side management (DSM). DSM offers solutions to problems such as load management, energy efficiency, strategic conservation and related activities.

The work of the DSM Technology Collaboration Program is organised through a series of [Tasks](#) and reported in a number of [publications](#). It is managed by an Executive Committee (ExCo). Visit the [News](#) page for the latest information on our activities.



Latest News

Behaviour Change & Energy News

Behaviour Change & Energy News – published weekly by Dr. [...] 4 December 2018

Issue 70 – Spotlight Newsletter - September 2018

Issue 70 – Spotlight Newsletter – September 2018 Task 24: [...] 23 September 2018

Issue 69 - Spotlight Newsletter - June 2018

Spotlight Newsletter – Issue 69 – June 2018 Task 16 [...] 20 June 2018

Task 24 releases cross-country case study comparison on Energy Saving Kit Programmes

As part of Task 24 Phase II we first undertake [...] 14 June 2018

Issue 68 - Spotlight Newsletter - March 2018

Issue 68 Spotlight Newsletter March 2018 – The Role of [...] 28 March 2018



Current participation



Participation

Participants in IEA DSM

Australia	Republic of Korea	United Kingdom
Austria	Netherlands	United States
Belgium	New Zealand	
Finland	Norway	RAP (sponsor)
India	Spain	ECI (sponsor)
Ireland	Sweden	EfficiencyOne (sponsor)
Italy	Switzerland	

Sub menu

Participants in IEA DSM

Benefits of participation

How to participate

Tasks open for participation

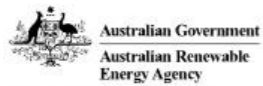
Current participation by Task

Benefits of participation

- Enables complex and/or expensive projects to be undertaken



An opportunity to re-engage



ARENA

WHERE WE INVEST | **FUNDING** | PROJECTS | KNOWLEDGE | A-LAB | MEDIA CENTRE | ABOUT | CONTACT

ARENA WIRE



International Engagement Program

International Engagement Program (IEP) - enhancing Australia's global knowledge of renewable energy technologies to advance innovation.

This program is closed.

ARENA has awarded \$4.8 million in funding to 12 projects to support international engagement in relevant International Energy Agency (IEA) Technology Collaboration Programmes (TCP) and Mission Innovation (MI) Challenges.



The program will increase Australia's capacity to innovate in the renewable energy space by strengthening international relationships and research collaborations, and by providing access to world-leading knowledge on renewable energy research, innovations and markets.

ARENA funding - \$4.8 million



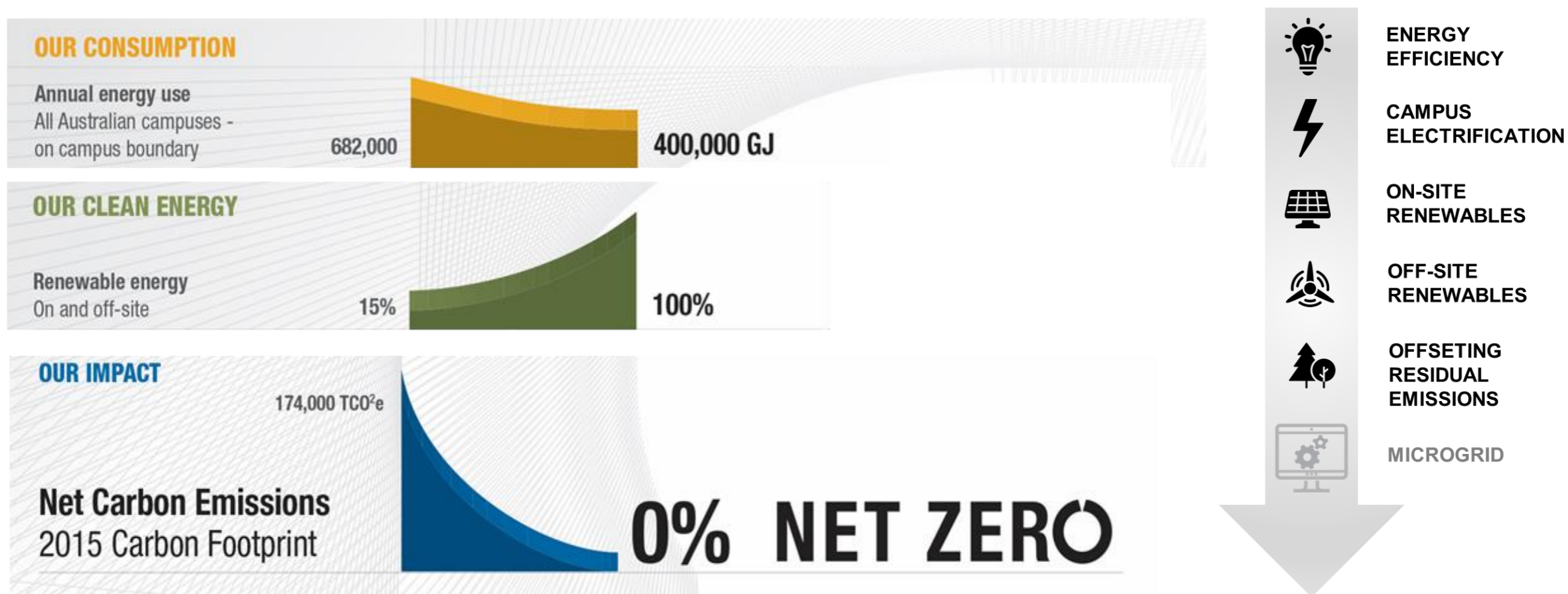
IEP Program Outcomes

- Smart Grids Innovation Challenge – CSIRO
- Off-Grid Access to Technology Innovation Challenge – University of New South Wales
- Converting Sunlight Innovation Challenge – University of Adelaide
- Affordable Heating and Cooling of Buildings Innovation Challenge – CSIRO
- **Demand Side Management TCP – Monash University and University of New South Wales**
- Oceans Energy Systems TCP – CSIRO
- Hydrogen TCP – Australian Association for Hydrogen Energy
- Solar Heating and Cooling TCP – Australian PV Institute
- Bioenergy TCP – Bioenergy Australia
- Solar Power and Chemical Energy Systems TCP (SolarPACES) – CSIRO
- PV Power Systems TCP – Australian PV Institute
- Hydropower TCP – Hydro Tasmania

Monash Net Zero Initiative

In 2017, Monash University set the ambitious challenge of powering its four Australian campuses with 100% renewable energy and act as a showcase for a broader transformation of our energy system.

Monash's commitment: Net Zero Emissions by 2030



To prepare itself to take advantage of a 100% renewable-powered energy grid, Monash is electrifying its campuses and enhancing its ability to control demand in response to dynamic market pricing

“Solve grand energy challenges through innovative research and partnership”

Capabilities:

	<h3>Energy Materials</h3> <ul style="list-style-type: none"> • Photovoltaics • Energy Storage • Catalysts • Fuel Cells • Low-Energy Building Materials • Magnetic Materials • Energy-Efficient Manufacturing 		<h3>Energy Processing</h3> <ul style="list-style-type: none"> • Solar Fuels • Alternative Fuels (Hydrogen, Biofuel) • Energy in Mining • CO₂ Capture & Sequestration • Combustion • Gasification • Geothermal Energy • Shale & Coal Seam Gas 		<h3>Energy Systems</h3> <ul style="list-style-type: none"> • Wind and Transport Aerodynamics • Power Systems • Sensor and sensor networks • Network Techno-economic analysis
	<h3>Data Science & Security</h3> <ul style="list-style-type: none"> • Data Analytics • Immersive, Virtual and Augmented Visualisation • Energy Forecasting • Smart Grids • Cybersecurity 		<h3>Behaviour</h3> <ul style="list-style-type: none"> • Behavioural Transitions • Choice and Control • Trust • Behavioural Economics 		<h3>Policy & Markets</h3> <ul style="list-style-type: none"> • Regulatory and Policy Research • Economic and Market Modelling • Business Model

> 100 leading researchers working across 9 Faculties and Partnering Institutes



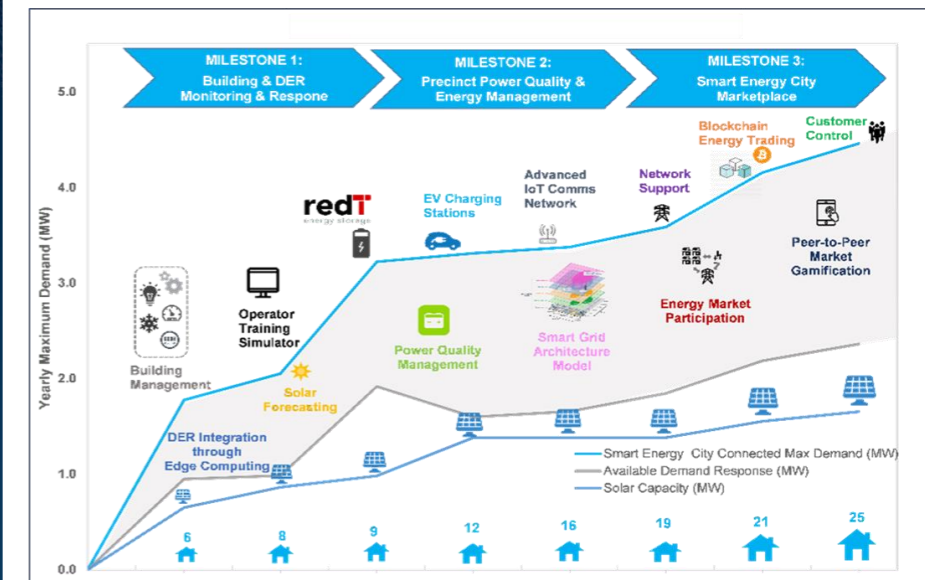
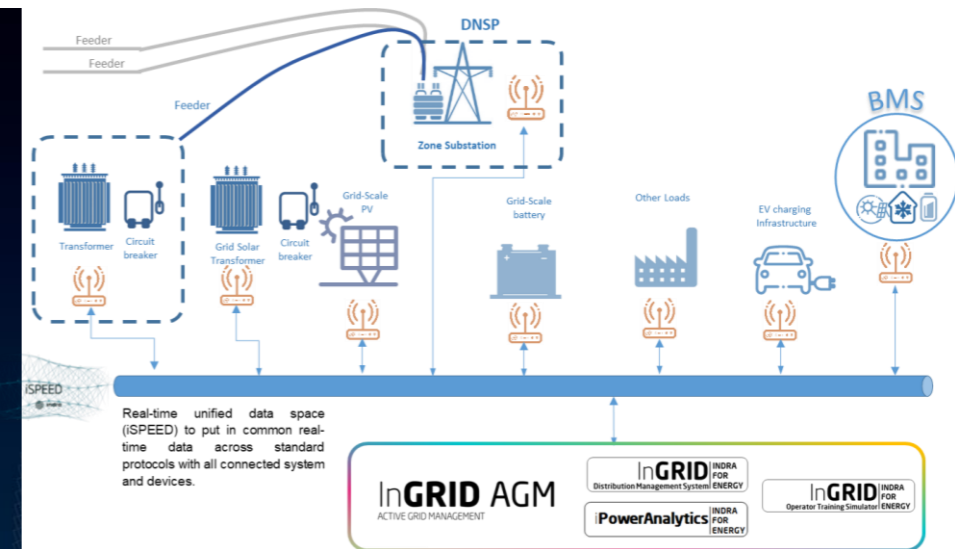
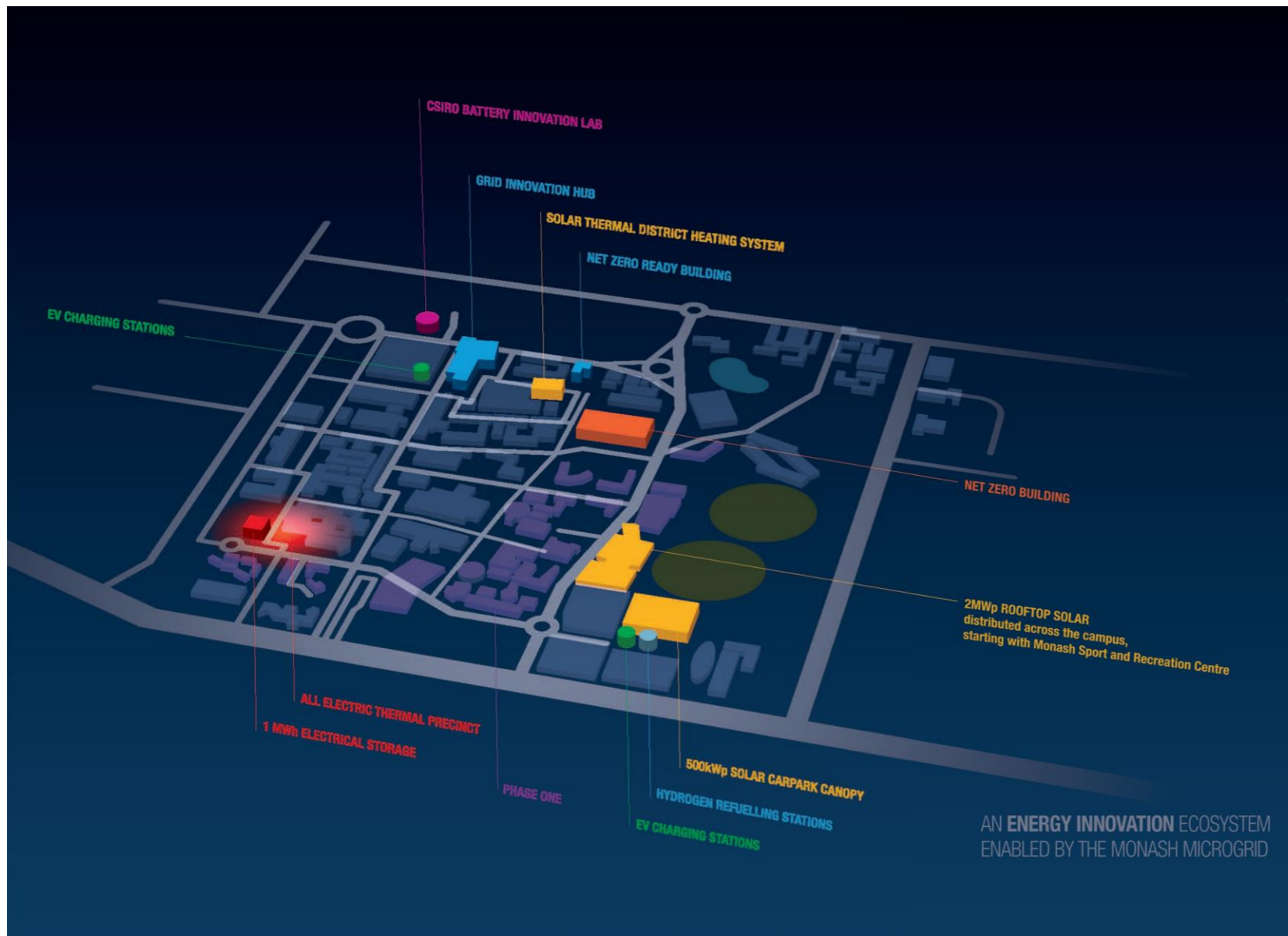
Impact Areas

Enabling Energy Transformation

Advancing New Energy Innovation

Eradiating Energy Poverty

Australian Research – Why did we get involved



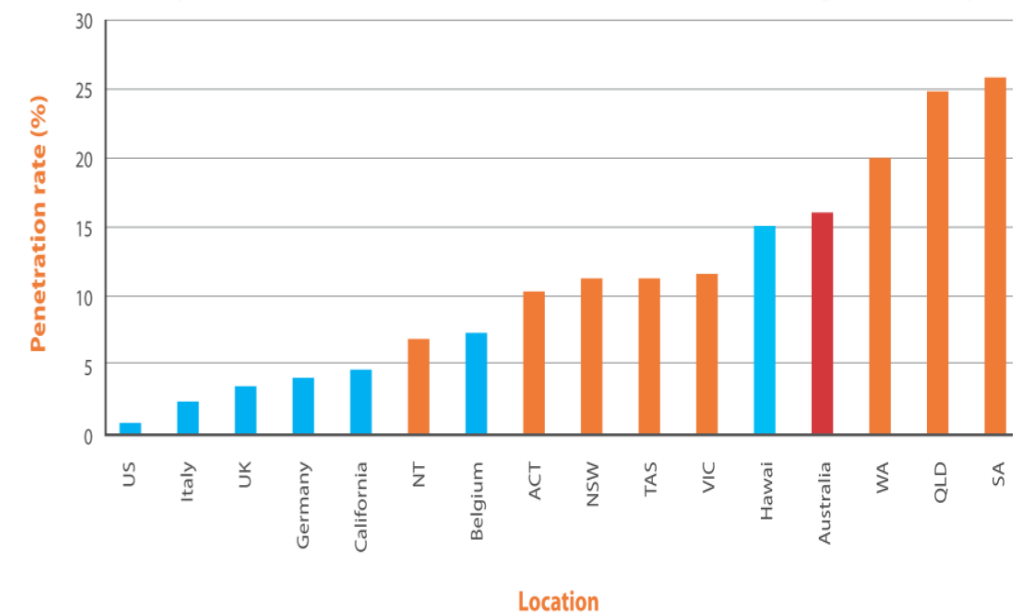
Australian Research - UNSW

The opportunity - a greater role for energy-users in our energy future

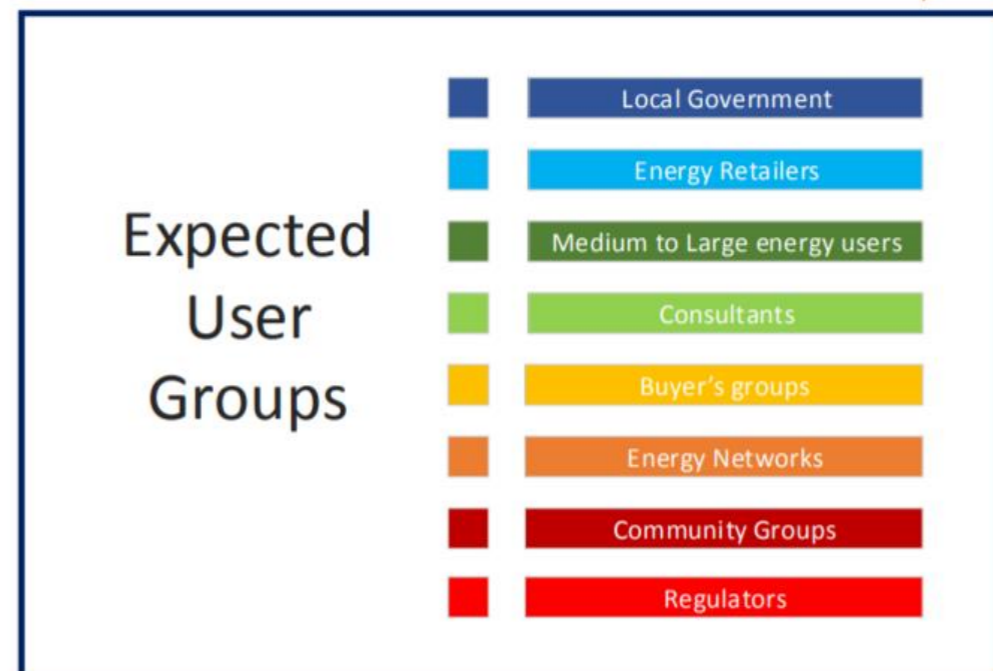
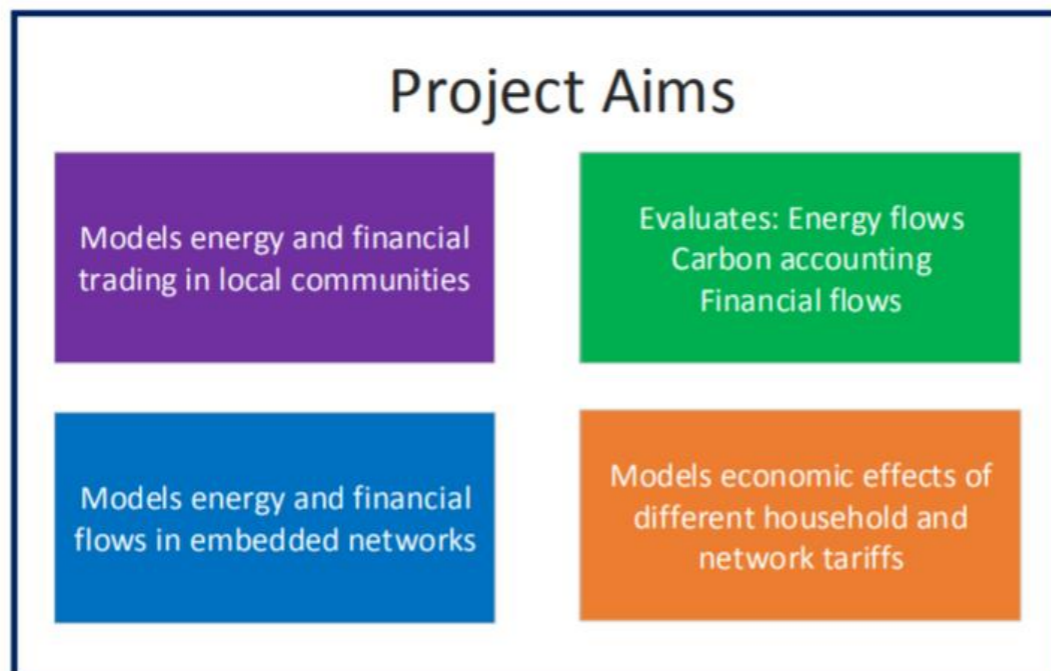
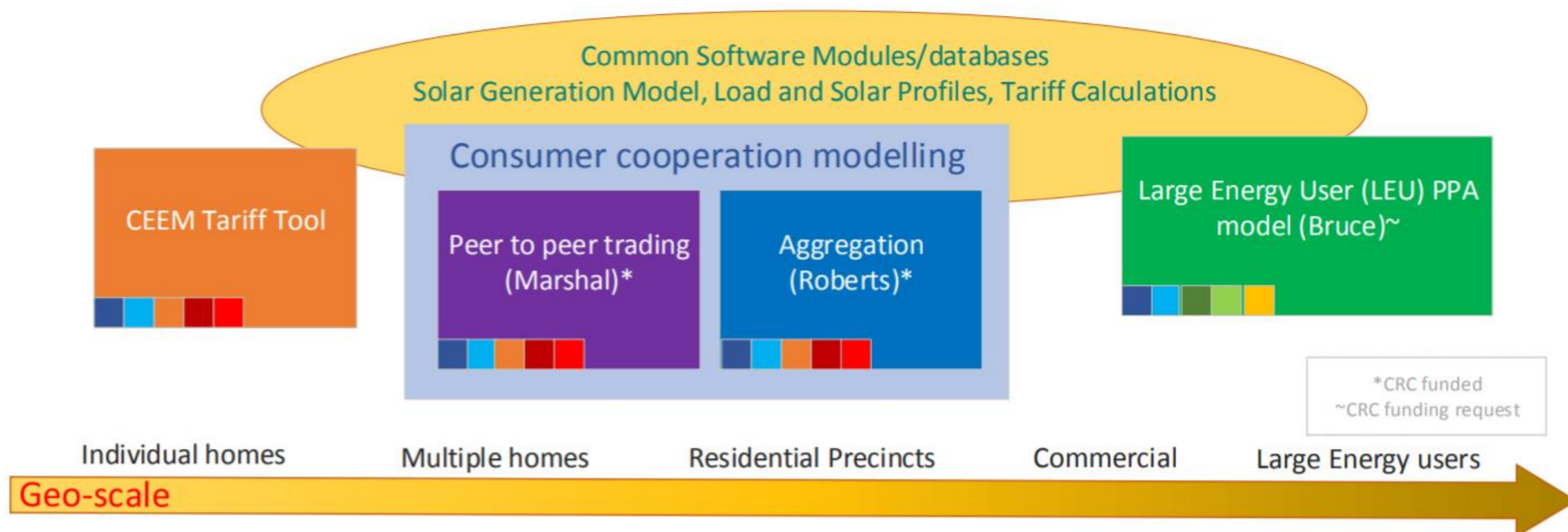
- A growing appreciation of our diverse energy users and contexts
- New opportunities for energy users to engage
 - PV, Storage, demand-side participation, energy efficiency
- Improving regulatory, market and policy efforts to appropriately facilitate end-user engagement
 - engage end users
 - From assumptions of rational, utility maximising individual customers driven by prices... to amore complex appreciation of energy decision making, individual yet also collective goals and actions, and hence coordination, sharing
 - *From heavy metal to orchestration ... perhaps to Jazz*
- *New ways to explore these challenges & opportunities; learn, disseminate and broaden the conversation*

Australia's residential PV penetration

(Finkel Review into NEM Security, 2017)



Australian Research – UNSW open-source tools



Some of the UNSW Distributed Energy Team

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github.com/unsw-ceem

Why is the DSM-TCP Re-launching

Context:

The increasing penetration of renewable generation, electrification of transport and heat, digitalisation and the blurring of the boundaries between consumers and producers are reshaping the energy demand landscape. There is a need to understand the ways in which people and technologies interact within society in order to create the conditions for new business models to flourish, for social innovation to thrive and for energy transitions to be successful.

Mission:

This TCP is to be a world-leading international collaboration platform for policy-relevant socio-technical research on energy use (i.e. demand side).

Objective:

The TCP is organised in to a series of tasks that bring together an international networks of social researchers, economists, political scientists and policy makers to work collaboratively on policy-relevant sociotechnical issues on demand side use of energy.

Relaunch and New Tasks

TCP is relaunching with an updated strategic focus on understanding of the nexus between people and energy technologies.

This includes the formation of new tasks

- Comparative analysis of the wide range of peer to peer trials, pilots and case studies
- Behavioural insights of driving the energy transition (industry wide, not just customer focused)
- and a task to understand how we achieving the social licence of automating demand side services required to provide stability on a network that has reduced system strength.

Proposed Task: Behavioural Insights

In most countries there is a clear need for policy action on energy use and flexibility.

Over the last decade, a number of countries have set up Behavioural Insights teams and programs to work on the application of the lessons from behavioural economics and psychology to the development and implementation of government policies. However, despite benefits that could be gained from sharing experiences in the application of behavioural insights in the energy sector, there is no international forum specifically devoted to energy-related issues in the area of energy-related behavioural insights

Desired Outcomes

- Share experience and expertise
- Develop guidance
- Original collaboration research
- Capacity building and dissemination



Proposed Task – Peer to Peer Observatory

The aims and objectives of the proposed Task are:

- lead global knowledge sharing through establishment of the preeminent policy and regulation focused global research network on community self-consumption and peer-to-peer energy trading
- create a global framework for working collaboratively with government, regulators, industry and consumers to help establish the policy and regulatory environments needed to deliver economic and market reform supporting new local energy business models
- to elicit policy makers' evidence needs for regulatory change in support of wider deployment of community self-consumption and peer-to-peer energy trading in different regulatory regimes
- to conduct a systematic, OECD wide, study of the relationship between the design of community self-consumption energy retail market structures and energy policy outcomes;

This proposed Task would operate on a task-shared basis, requiring in-kind contributions from National Experts in participating countries.

Proposed Task – Peer to Peer Observatory

Proposed Outputs

- A systematic review of the factors governing successful implementation of peer-to-peer energy trading in participating member countries.
- A suite of case studies of pilot or commercial peer-to-peer energy trading trials across the major world markets where they are being deployed. These will be written up in a standard format developed in conjunction with the IEA's Global Exchange Platform to ensure consistency of data gathered across cases, as well as the policy, regulatory and commercial relevance of the outputs.
- An International Qualitative Comparative Analysis of case studies across all participating countries to identify common success factors for deployment of peer-to-peer.
- Development of quantitative graphical statistical models of the comparative influence and interaction between factors governing uptake of peer-to-peer.
- Establishment of an international community of researchers willing to share learnings on peer-to-peer energy trading in a pre-competitive collaborative environment.
- Development of global metrics for tracking the uptake of peer-to-peer energy trading.

Proposed Task – Social Licence to Automate DER

Lessons from wind and non-conventional gas

- Technical compliance
- Environmental approvals
- Did not have a **Social Licence To Operate**
 - Protests
 - Political Influence
 - Interference in markets and optimal solutions



The need for rapid response DSM is increasing, requiring more automation of DER. If implemented poorly, automation can fail to provide whole energy system benefits and can disempower consumers

This “Social Licence to Automate” in the energy sector is an extremely difficult challenge for DSM, requiring the blending of social sciences, technology and policy research and will require insights and lessons from around the world.

Proposed Task – Social Licence to Automate DER

Expected outputs

- Create country profiles
- Profiling of the current state of the sector and identify required changes
- Map major trials in each country (e.g. detailed case studies exploring the internal dynamics of how new practices are being supported, maintained and replicated)
- Investigating the extent of energy literacy amongst different stakeholders in different markets
- Mapping the customer needs for automation algorithms; comparing existing tools to customer needs; and understanding how technology can enable the Social Licence to Operate
- Share the similarities and differences between countries regarding the influences on above (e.g. opportunity for learning from others based on different local, regional contexts etc.)

How do you participate

What is the opportunity

Focus and funding on knowledge sharing, not fundamental research

- Working with the IEA TCP – shaping an international as well as Australian DSM program
- We can take Australian research, experiences and lessons to the world, bring the same back from international partners, *and develop our shared knowledge, experiences and lessons with a focus on regulatory, market and policy outcomes*

Next Steps

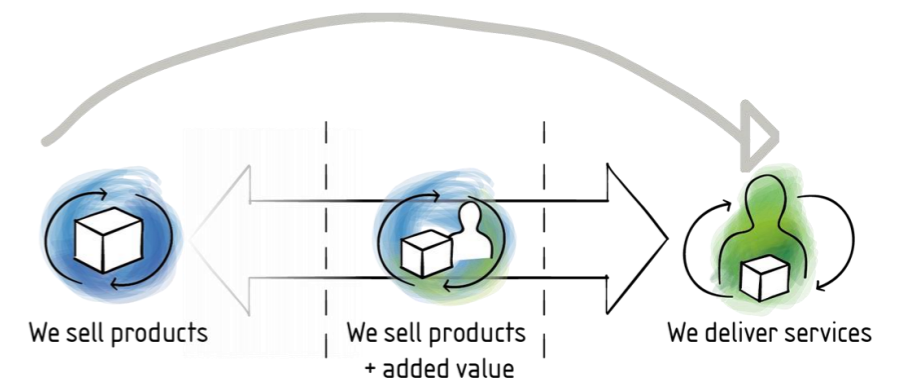
- Confirm resources at Monash and UNSW
- Set up Advisory Board – Applications will be called for soon
- Create communities of practice for each task
- Understand where they overlap other programs in Australia and build on the IEA platform to compliment this work

Discussion

- Stakeholders?
- What can different stakeholders get out of this?
 - Maximising the value of IEA and International collaboration
- Advisory Board
 - How to maximise its value for participants
- Task participation
 - Existing: Task 25 on business models
 - Peer to peer observatory: Comparative analysis of the wide range of peer to peer trials, pilots and case studies
 - Behavioural insights: of driving the energy transition (industry wide, not just customer focused)
 - Automation: to understand how we achieving the social licence of automating demand side services required to provide a range of valuable services

Task 25 – Business Models Phase 2

The fields of energy efficiency, demand flexibility and renewable energy would benefit greatly from “servitisation”



In this phase key issues are

- Under which system conditions can an energy service flourish?
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Proposed Task – Peer to Peer Observatory

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Final thoughts suggestions

Thankyou

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