



Australian Government

**Department of the Environment,
Water, Heritage and the Arts**



ENVIRONMENT

WATER

HERITAGE

ARTS

Consultation Workshops

**Smart Grid, Smart City
National Energy Efficiency Initiative
(NEEI)**

July 2009



Australian Government

Department of the Environment, Water, Heritage and the Arts



What is Smart Grid, Smart City?

Overview

- 2009 Budget—announcement of up to \$100 million to deliver a commercial scale Smart Grid rollout
- Subject to pre-deployment study, which will investigate business case
- Successful bid for the Smart Grid, Smart City will be chosen through an open competitive process later this year
- Project delivery will be through an integrated consortium



Objectives of the Smart Grid, Smart City initiative

Deploy
commercial-
scale rollout

- Deploy a commercial-scale Smart Grid City in Australia

Inform
broader rollout

- Provide best practice demonstration
- Gather information and data to inform a broader industry roll-out of Smart Grids across Australia

Build
awareness of
benefits

- Build public and corporate awareness of the economic, technological and environmental benefits of smart grids

Investigate
synergies

- To investigate synergies with water and gas networks, and the rollout of the National Broadband Network



Objectives of the Pre-Deployment Study

Benefit estimation

- Provide further information to the Government on the potential economic and environmental benefits of smart grids technologies

Maximising impact of Smart Grid, Smart City

- Investigate best way to maximise the benefits of the Government's \$100 million investment in the NEEI Smart Grid

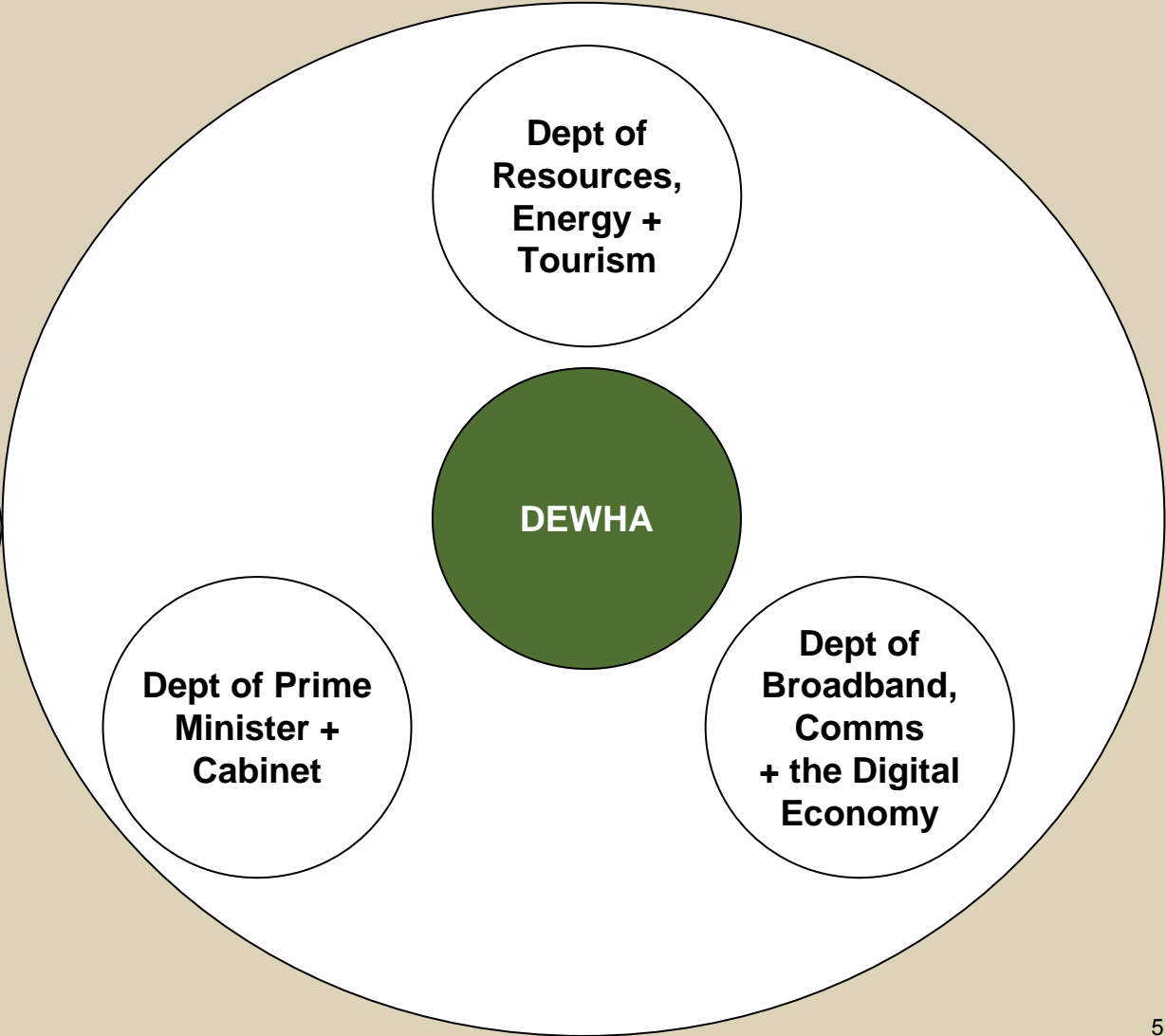
Project design for Smart Grid, Smart City

- Explore best governance framework and business model for the initiative, and how best to bridge any gaps in knowledge about the benefits

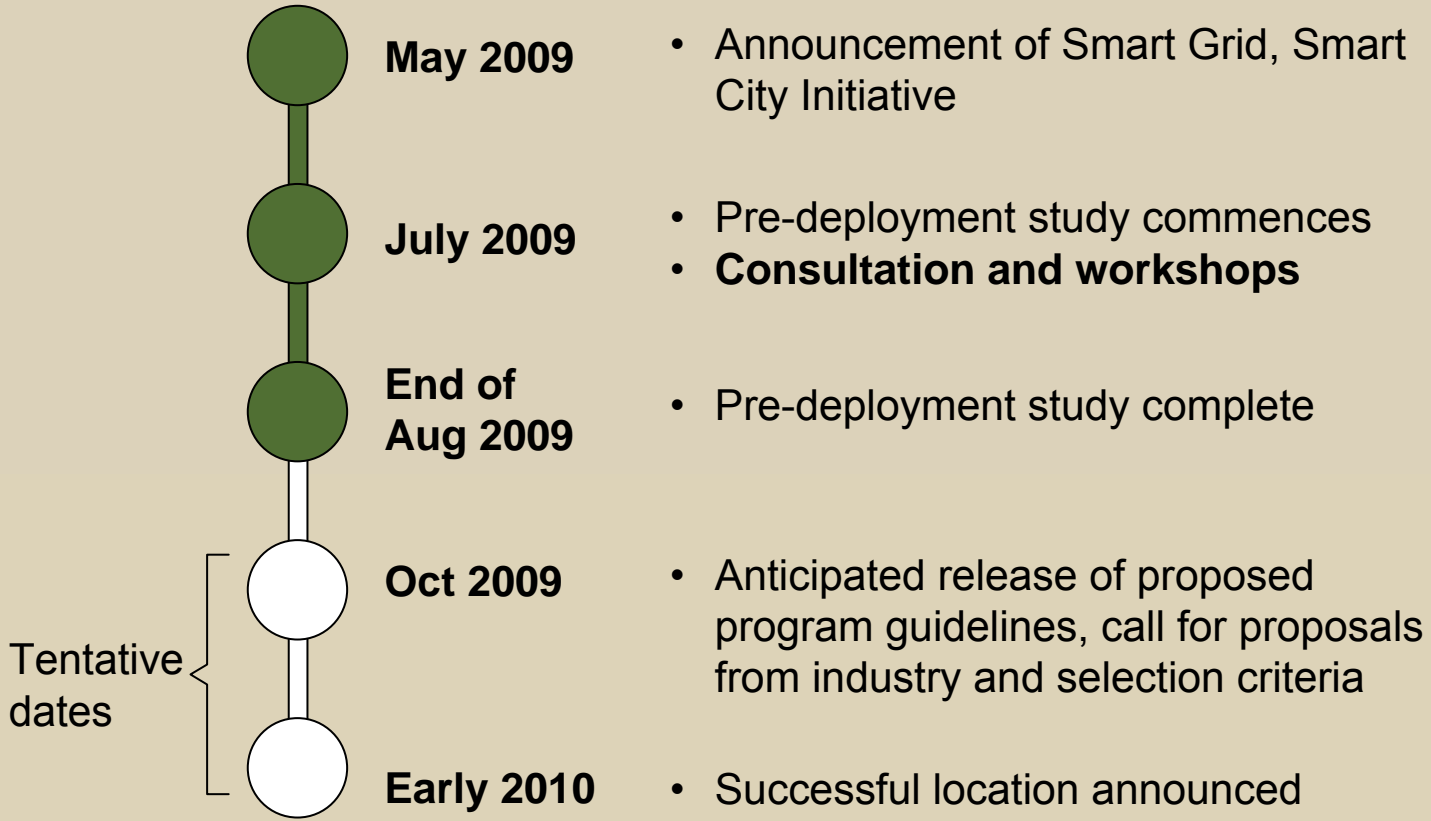


Current governance of the predeployment study

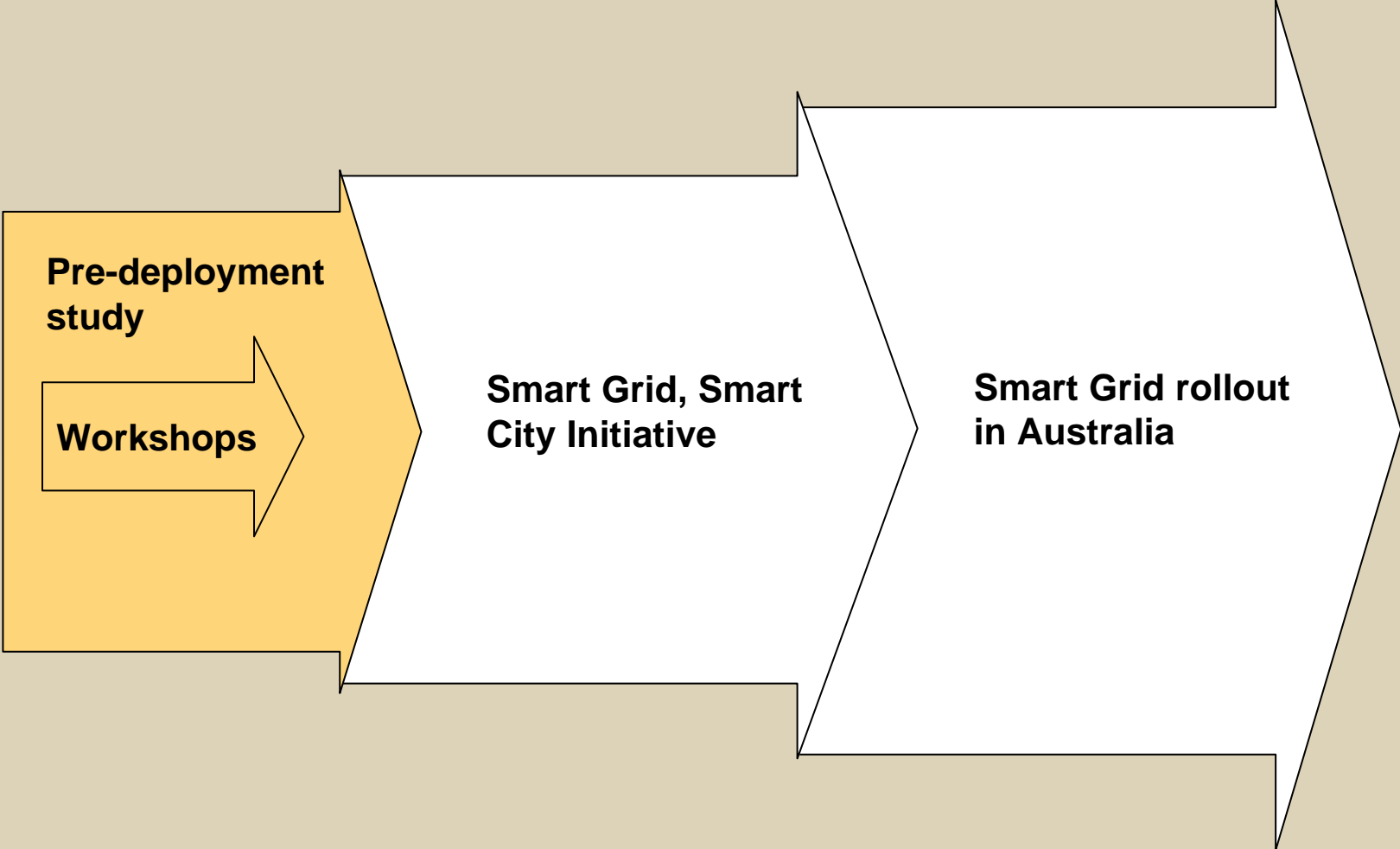
- DEWHA has direct responsibility for Smart Grid, Smart City initiative and delivery of pre-deployment study
- Working in collaboration with other relevant government departments



Proposed timeline for NEEI Smart Grid, Smart City initiative



The purpose of today is to get your input on what you think the Smart Grid, Smart City initiative should look like



Ground Rules for the day

Open discussion space

- Decisions have not been made—all ideas are welcome
- We encourage participants to make constructive comments and criticisms throughout the day

Role of Facilitators

- Facilitators are there to encourage discussion in the group, to structure the discussion and to ensure everyone is heard
- This is about getting your input

Staying on topic

- Facilitators will be keeping discussion on the topic set out for each session
- Off-topic comments will be captured on “issue boards”

How we are using your input

- Feed into the pre-deployment study
- General themes and concepts may be used in other materials
- You will receive minutes to capture discussion themes

Attribution of comments

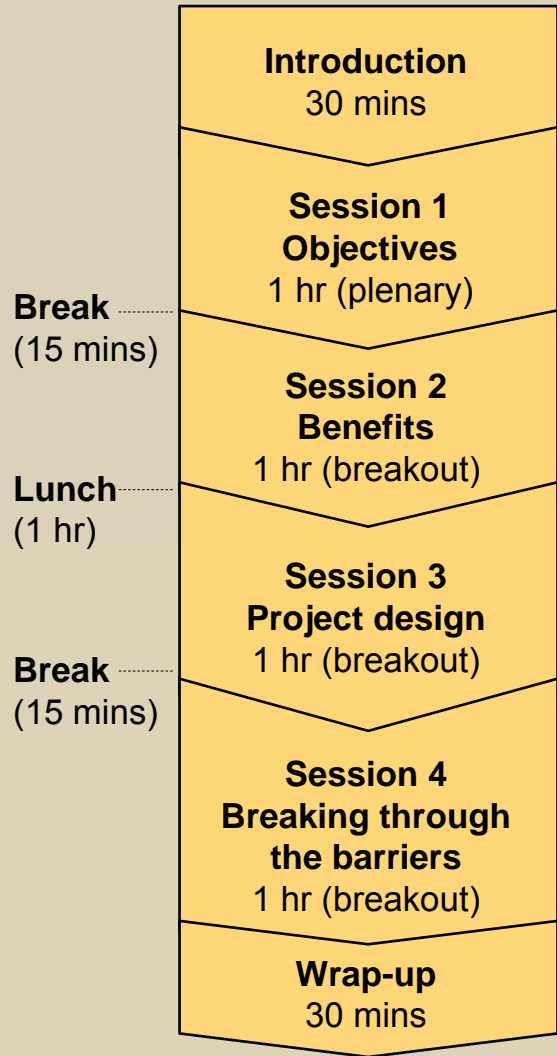
- Comments from today will only be attributed to a person or organisation if we get express permission from you

Housekeeping

- Please turn off mobile phones or switch to silent



Today's conversation about Smart Grid/Smart City



Purpose

- Set context for the day
- Discuss objectives of + priorities for the Smart Grid, Smart City initiative
- Discuss which Smart Grid benefits are important to you and implications for Smart Grid, Smart City
- Discuss views on detailed elements of Smart Grid, Smart City initiative— selection criteria, governance, dissemination of learnings
- Identify barriers to Smart Grid rollout in Australia and how Smart Grid, Smart City can help address them
- What do we agree on? What areas are we still debating?
- What further areas for exploration?



Structure of Breakout Sessions

	Full Group	Breakout Groups		Full Group
Step	Introduction to session	Facilitated Questions	Summary of Key Points	Present back to plenary
Time	5 minutes	35 minutes	5 minutes	15 minutes
Description	<ul style="list-style-type: none"> ▪ Outline purpose of session ▪ Identify end product to be produced 	<ul style="list-style-type: none"> ▪ Icebreaker and introductions ▪ Facilitator stimulates discussion with questions ▪ Any off-topic points recorded on issue boards 	<ul style="list-style-type: none"> ▪ Run through recorded notes with group ▪ Play-back “results” and gauge reaction ▪ Adjust/Add if necessary 	<ul style="list-style-type: none"> ▪ Nominee presents breakout “results” to full group



Objectives of Smart Grid, Smart City

Session 1 (Plenary)



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Session 1 (Plenary): Objectives of Smart Grid Smart City

Purpose of this session

- To discuss what you think the objectives of the Smart Grid, Smart City demonstration project should be

Key Questions

1. What are the key dimensions for thinking about the objectives of the Smart Grid, Smart City demonstration project?
2. How would you prioritise these objectives?



The 'smart' in Smart Grid

Conventional technology

Smart grid technology



Customer perspective

- Manual meter reads w/**estimated bills**
- Little visibility of own consumption patterns
- **Limited visibility** into outages and timing of restoration



- Automated, **more-accurate meter reads**
- Visibility and **control of usage** (with financial results and greenhouse gas impact)
- **Fewer outages** and **faster restoration** when they occur

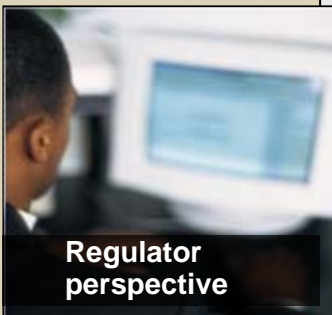


Industry perspective

- **Some manual processes**
- Reactive outage restoration
- **Limited visibility** into current network usage and conditions
- **Supply-side focus**
- **Limited customer insight for retailers**



- **Fewer hand-offs** through automation
- **Grid automation** to limit system breaks
- Real-time and statistical visibility into network conditions and patterns
- **Influence demand** to reduce peak needs
- Greater customer insight—better products, dynamic pricing



Regulator perspective

- Some manual operations with potential for process breaks
- **Incremental improvements** in reliability
- Limited ability to target investment on specific operating dimensions

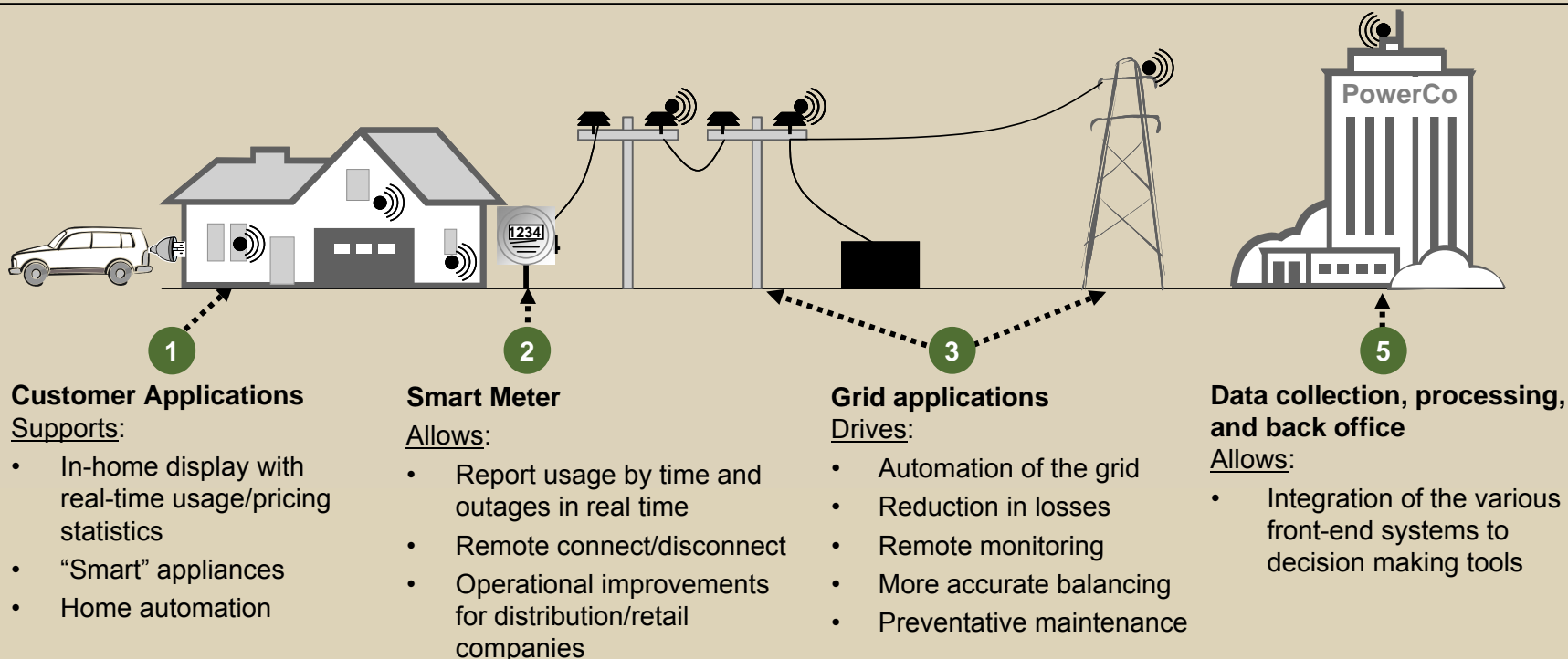


- Streamlined and automated systems to deliver **more reliable service** and **customer satisfaction**
- Ability to target investments to regulatory priorities



Potential framework to define scope of Smart Grid

Transmission, distribution and customer environment



Customer Applications

Supports:

- In-home display with real-time usage/pricing statistics
- “Smart” appliances
- Home automation

Smart Meter

Allows:

- Report usage by time and outages in real time
- Remote connect/disconnect
- Operational improvements for distribution/retail companies

Grid applications

Drives:

- Automation of the grid
- Reduction in losses
- Remote monitoring
- More accurate balancing
- Preventative maintenance

Data collection, processing, and back office

Allows:

- Integration of the various front-end systems to decision making tools

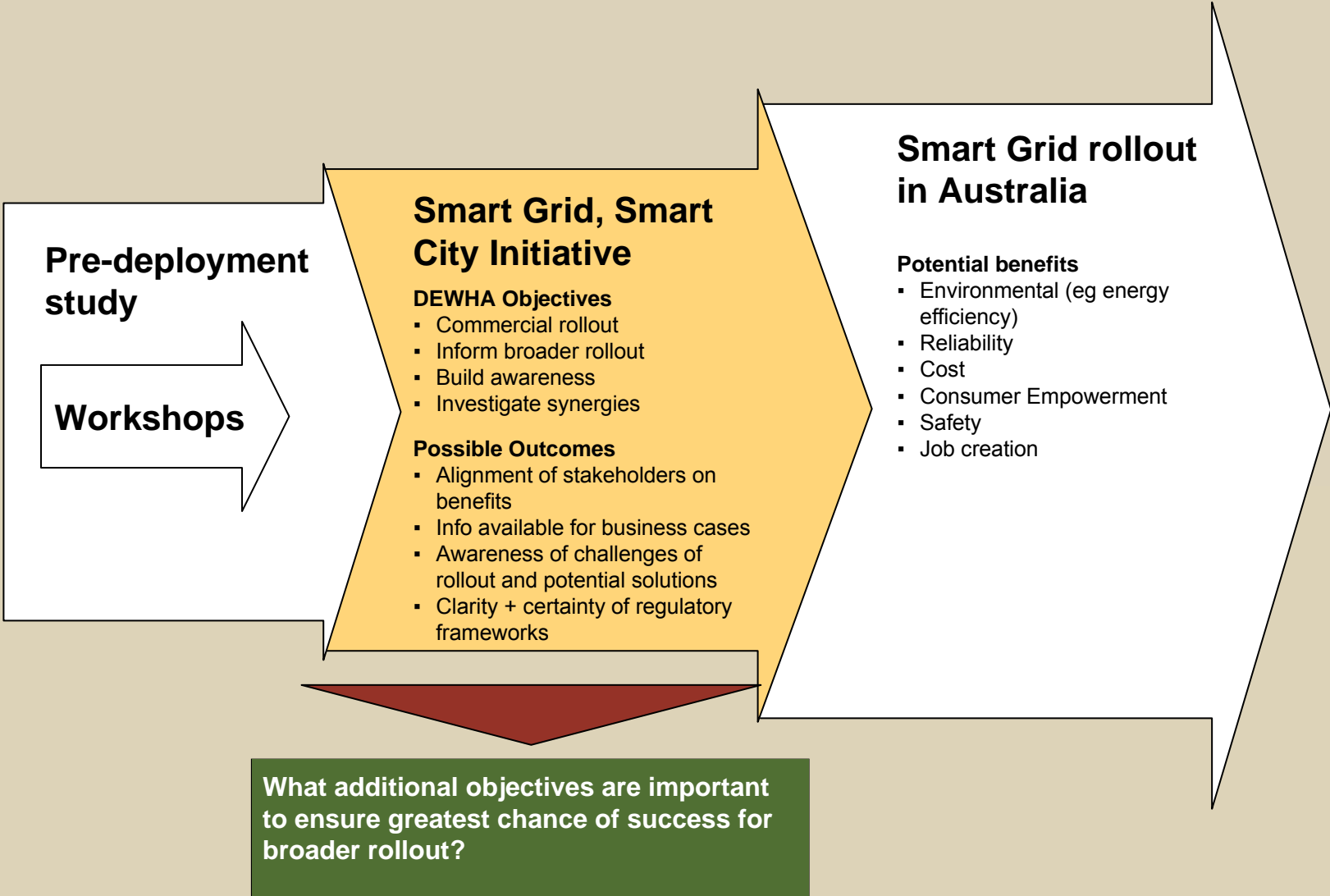
4 Better integration of renewables, distributed energy and electric vehicles

Facilitates:

- Integration of back-up, storage, distributed solar & wind generators
- Disconnection in case of network overload and for safety purposes
- Electric vehicles connect to grid to recharge and to provide additional storage for the network to be drawn on at peak times



Positioning objectives of the Smart Grid, Smart City demonstration project



Benefits of Smart Grids

Session 2 (Breakout)



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Session 2 (Breakout): Benefits of Smart Grids

Purpose of this session

- To have a deeper discussion on what benefits will have the most impact on society

Key Questions

1. What are the most important benefits?
2. How would you prioritise these benefits?
3. Therefore which applications should be tested in Smart Grid, Smart City? What other things is it important to test?



What are the potential benefits of a Smart Grid rollout across Australia?

Environment

Reduce GHG emissions through increased efficiency and greater use of renewable generation

Consumer Empowerment

Give consumers greater control over their energy use, energy bills and environmental impact; develop platforms for new/innovative services

Reliability

Reduce downtime due to better outage diagnosis, self-healing grids and distributed sources

Safety

Automatically isolate and de-energise lines for maintenance or emergency reasons; automatic disconnection of distributed energy

Cost

Reduce network investment and/or operational expense

Job creation

Develop Smart Grid industry in Australia—new jobs from domestic rollout and with potential to market expertise overseas



Which Smart Grid applications should Smart Grid, Smart City test?

Applications

<p>1 Smart Meter</p>	<p>Advanced Metering Infrastructure (AMI), eg Connect/Disconnect</p>			
<p>2 Customer Applications</p>	<p>Advanced pricing/billing</p>	<p>On-premise devices including Smart Appliances</p>		
<p>3 Grid applications</p>	<p>Substation and feeder monitoring</p>	<p>Volt VAR management/monitoring</p>	<p>Fault detection, identification and response (FDIR)</p>	<p>Phasor measurement</p>
<p>4 Enablement of renewables & distributed energy</p>	<p>Distributed generation connectivity</p>	<p>Renewables enablement</p>	<p>Electric vehicle connectivity</p>	<p>Storage enablement</p>
<p>5 Data collection, processing, and back office</p>	<p>Communications network</p>		<p>Backoffice software and infrastructure</p>	



Project design considerations

Session 3 (Breakout)



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Session 3 (Breakout): Project design considerations

Purpose of this session

- Discuss views on detailed design questions for Smart Grid, Smart City initiative—selection criteria, governance, dissemination of learnings

Key Questions

1. How do you maximise the applicability of the findings? Method or location?
2. What are the most important selection criteria for Smart Grid, Smart City location?
3. How should the program be structured to “prove” key value drivers?
4. How do we ensure lessons from Smart Grid, Smart City are disseminated—what information do you need in order to trust and act on its findings?



What do you think the key design features of the Smart Grid, Smart City should be?

Project Design Elements

Location

- One or many
- What can we do to make the roll-out applicable to as many locations as possible?

Duration

- Total roll-out timing
- Continuing role after initial roll-out

Governance model—who makes decisions and how?

- Ownership
- Oversight
- Decision-making process

Dissemination of learnings

- Ownership of Intellectual Property / data

Methodology

- Metrics
- Baseline
- Measurement process

Selection Process

- Eligibility criteria
- Bid structure

Technology and Vendor Evaluation Process

- Future proofing

Project Design Elements

Stakeholder roles

- Generator
- Distributor
- Retailer
- Government—local, state, federal
- Technology providers
- Service providers

Lifecycle management

- Operations
- Retirement
- Ongoing lab concept



What are the project “must have’s”?

Potential Project Must Have’s

- **Statistically significant**
- **Government investment is seed money— consortium to bring further investment to the project**
- **Ensure bang for buck**
- **Transparency**
- **Leverage existing work and build on ‘business as usual’**
- **Transferrable learnings for broader industry group**

Questions:

1. What is missing?
2. What is most important?



Breaking through the barriers

Session 4 (Breakout)



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Session 4 (Breakout): Breaking through the barriers

Purpose of this session

- Identify barriers to Smart Grid rollout in Australia and how Smart Grid, Smart City can help address them

Key Questions

1. What barriers are there to the rollout of a Smart Grid in Australia?
2. Which of these barriers can Smart Grid, Smart City help to address?
3. Which barriers can Smart Grid, Smart City not address?
4. What is the best approach for solving these remaining barriers?



Potential barriers to broader Smart Grid rollout

- 1 Regulation**
 - Rate case planning timeframe
 - No framework to recognise higher intrinsic risk and required return
 - Regulatory uncertainty (eg no pass-through regime for Smart Grid investment, approach to stranded assets)
 - No framework for R+D investment
 - Limited regulation of opex categories (eg customer education, conducting in-home audits)
 - Regulatory inconsistency across jurisdictions
 - Uncertainty in medium to long term
 - Access to spectrum

- 2 Allocation of benefits in deregulated environment**
 - Who pays and who gets benefits

- 3 Proof of benefits**
 - Limited understanding of applications and resulting business cases
 - Unclear what drivers of inputs are and how they change service territory

- 4 Technology**
 - Technology maturity
 - Standards and interoperability
 - Scalability and ability to support future applications

- 5 Customer uptake**
 - Understanding what will motivate consumers to change behaviour
 - How to educate consumers

- 6 Industry change required**
 - Business processes
 - Change management
 - Capabilities

- 7 Security and Privacy**
 - Data privacy
 - Digital security
 - Physical security

Questions:

- 1. What is missing?**
- 2. What is most important?**
- 3. What should Smart Grid, Smart City address?**



Wrap-Up



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How we will communicate with you from here

1

Minutes from Workshops

- We are preparing summary minutes of what we hear at the workshops
- These will be sent to participants by email to give chance to comment and for your reference

2

Ongoing dialogues during the pre-deployment study

- We are looking forward to engaging in continuing dialogues with you over the course of the pre-deployment study
- Contact us at email address with follow-ups, thoughts or concerns

3

Public pre-deployment report

- Workshops and other consultation are feeding into the pre-deployment study

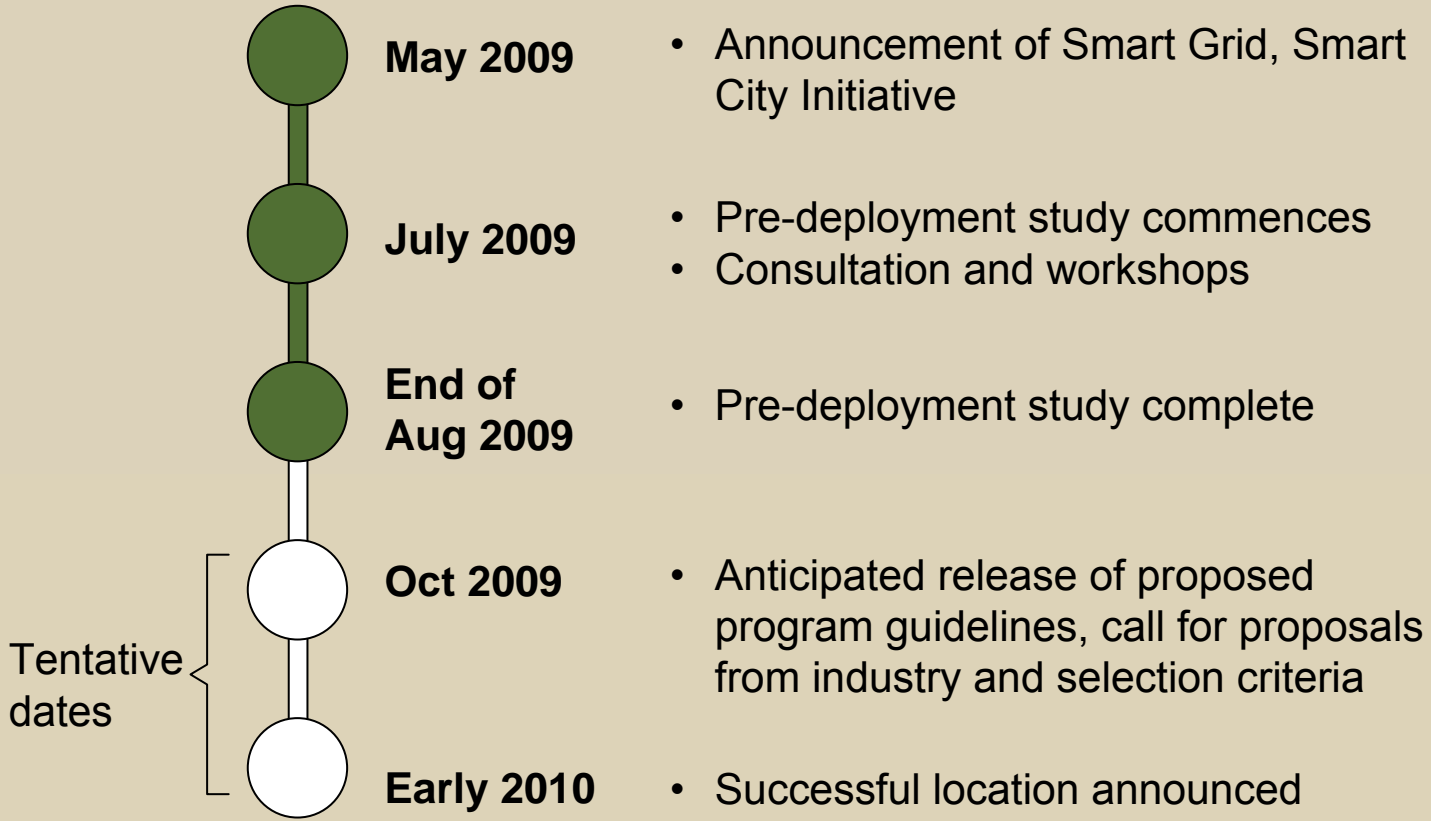
4

Selection documentation

- Highlight key challenges, selection criteria, how to put bid and consortia together



Proposed timeline for NEEI Smart Grid, Smart City initiative



Email

smartgridinitiative@environment.gov.au

Website

www.environment.gov.au/smartgrid/

