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# IEA Smart Energy Systems roadmap
# Introductory remarks

**Laszlo Varro, Chief Economist, IEA**

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# IEA Smart Energy Systems roadmap
# Kick-off workshop, 1st March

*Luis Munuera, PhD*

*Energy Technology Policy Division*

*IEA*

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# IEA Energy Technology Activities

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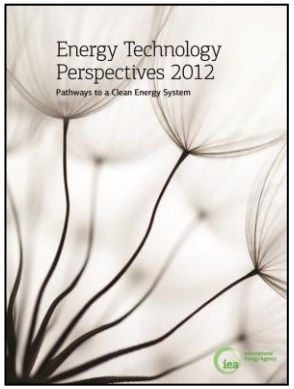
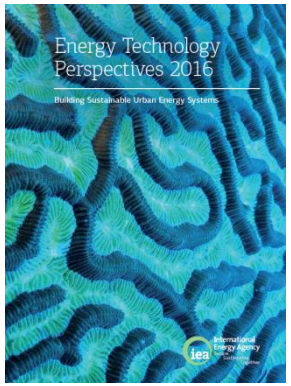
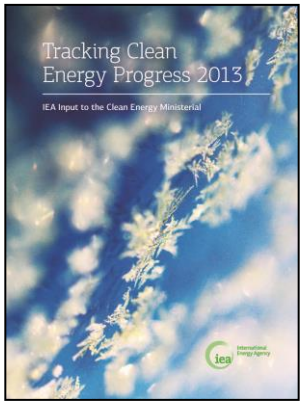
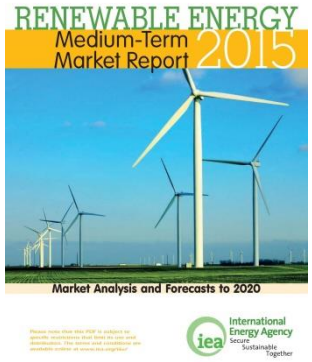
- Where do we need to go?



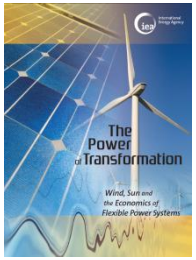

- Where are we today?




- How do we get there?





# What defines an IEA technology roadmap?



***"A roadmap is a strategic plan that describes the steps an organisation needs to take to achieve stated outcomes and goals. It clearly outlines links among tasks and priorities for action in the near, medium and long term. An effective roadmap also includes metrics and milestones to allow regular tracking of progress towards the roadmap's ultimate goals."***

Energy Technology Roadmaps: a guide to development and implementation, IEA, 2014

# What defines an IEA technology roadmap?



- **Roadmap goal - present international consensus on a given technology:**
  - Dynamic set of technical, policy, legal, financial, market & organisational requirements
  - Identify which actions are needed to accelerate the overall RDD&D process at the speed and to the scale required to meet energy policy objectives
  - Barriers and obstacles and how to overcome, technical, market and policy milestones

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# IEA roadmaps: a living library

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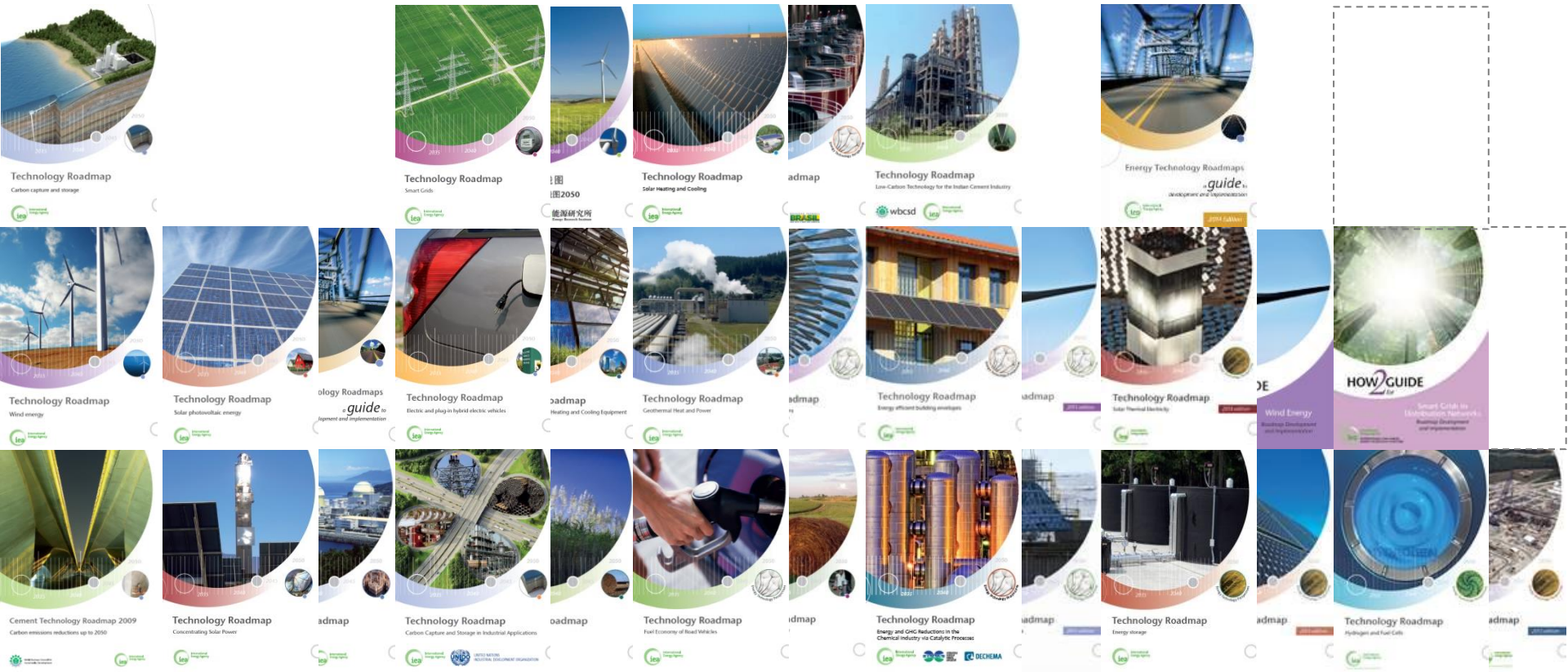
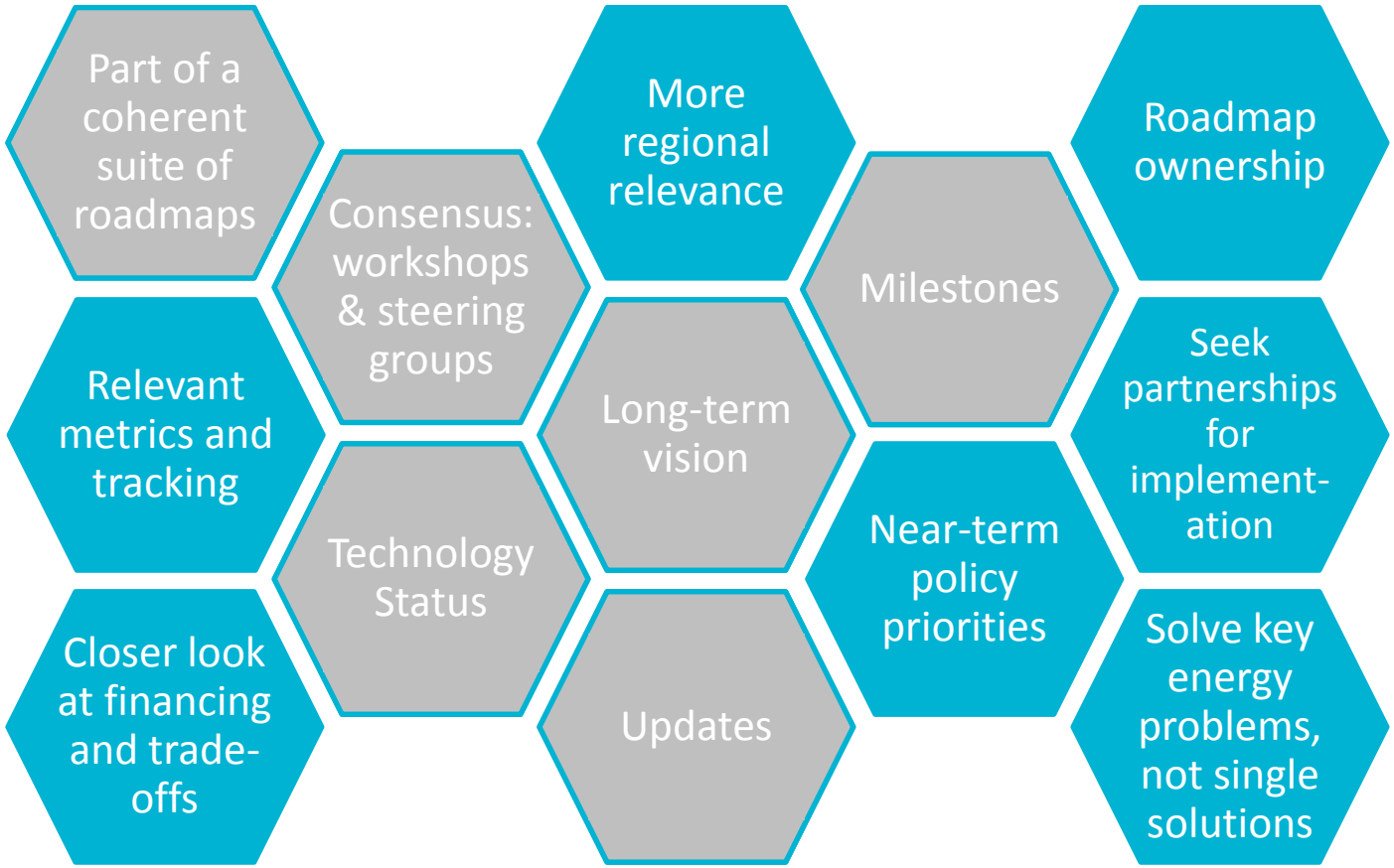



2009 2010 2011 2012 2013 2014 2015

**32 publications, 21 different technology areas**

# Building the new cycle on existing foundations




# Updating Knowledge: 2016 Smart Energy Systems roadmaps



## Primary goal - Present international consensus on future grid technologies

- Shift from Smart 'Grids' to Smart Energy Systems

1. **Where is technology today?**

   Deployment, performance, costs

2. **What is the deployment pathway needed to achieve long-term goals?**

   State-of-the-art data and analysis

   Expert consensus

3. **What are the priority near-term actions?**

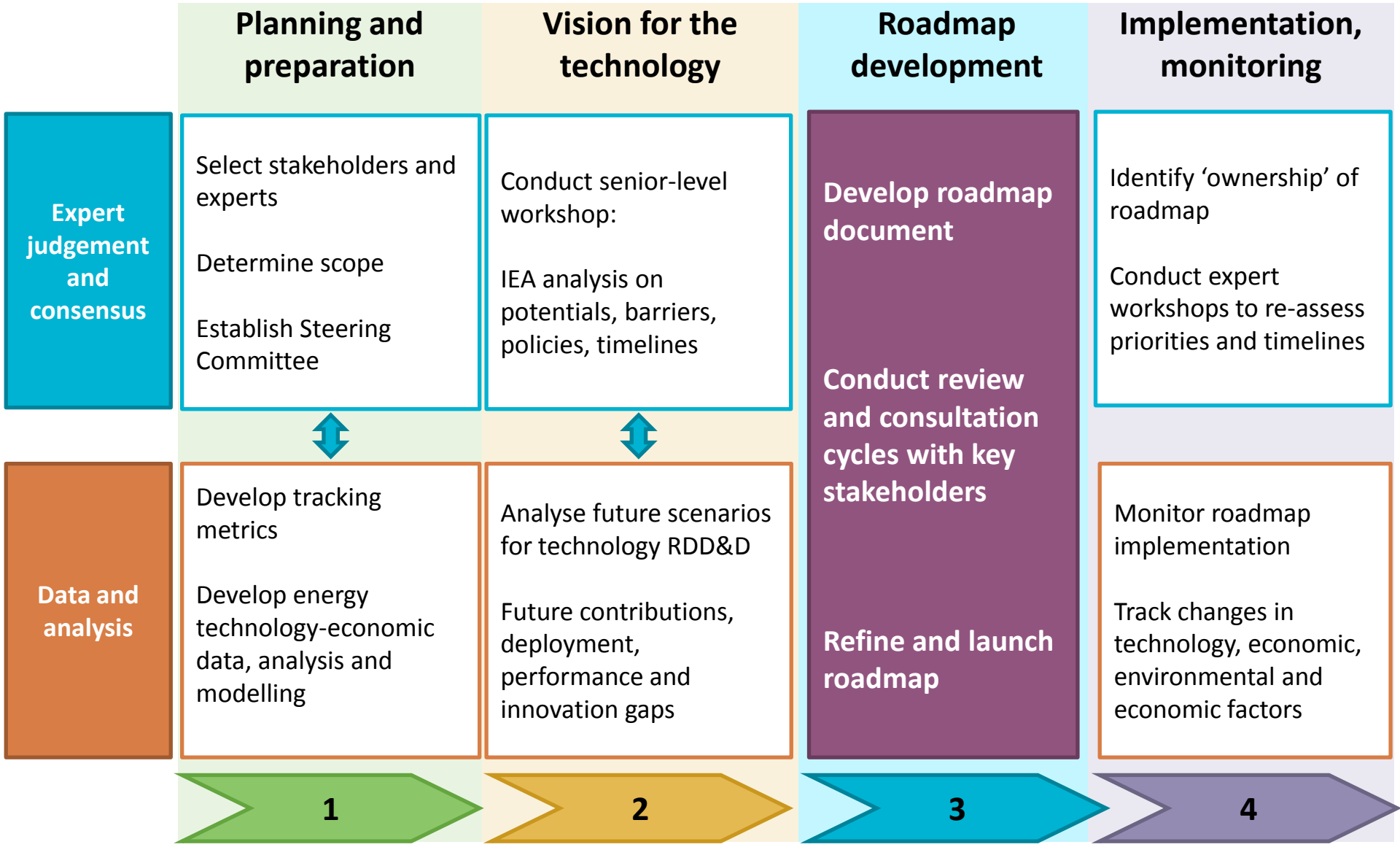
   Innovation gaps and how to fill them

   Identify barriers and obstacles and how to overcome

   Market requirements and policy needs

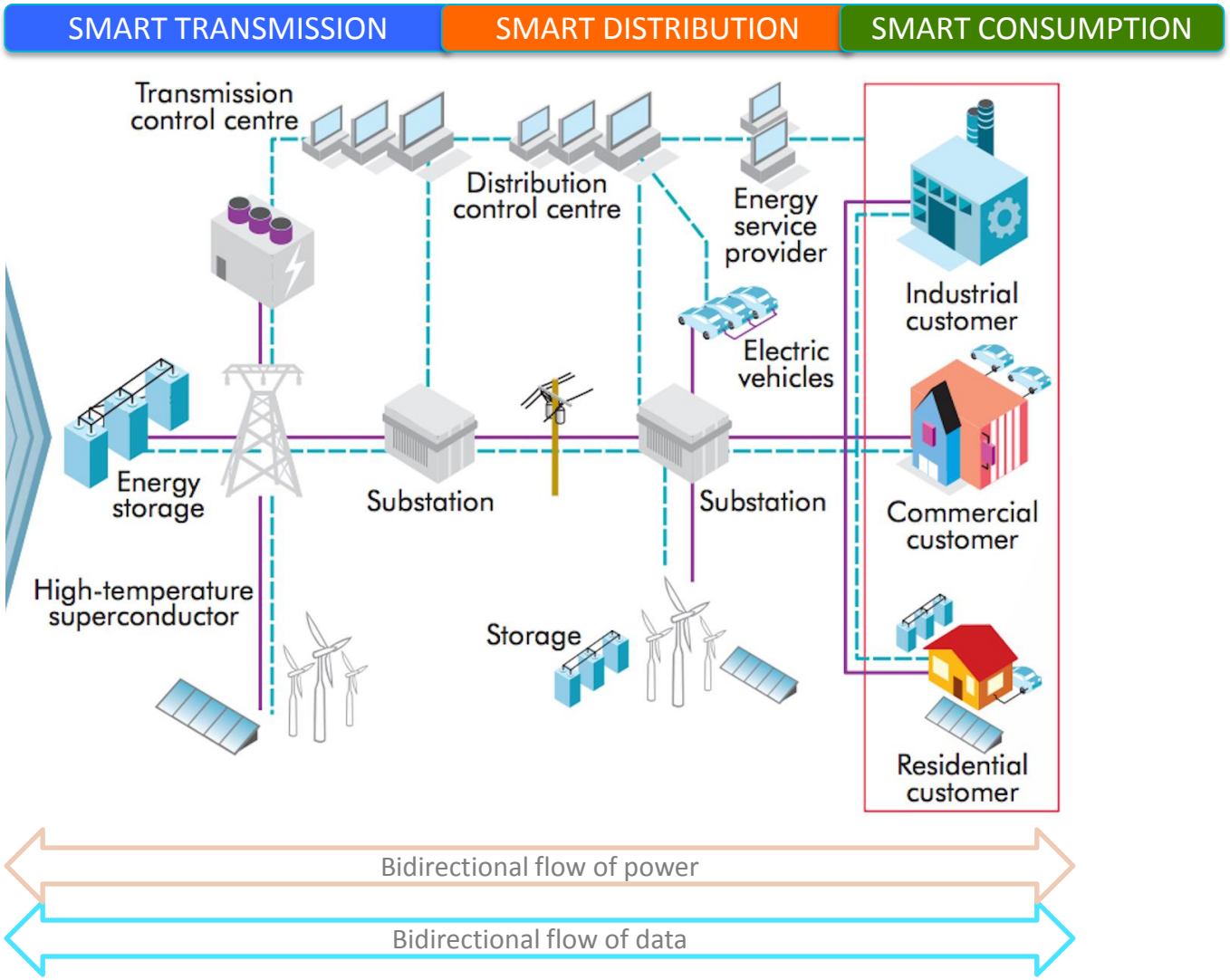
   International collaboration needs

# Roadmap process



# First workshop: Scaling up smart energy systems





# First workshop: Scaling up smart energy systems



SMART TRANSMISSION | SMART DISTRIBUTION | SMART CONSUMPTION

- **Session I: Current status of smart energy systems**
  - Emerging trends, leading technology areas and markets, business models and concepts
- **Session II: Technology frontier for smart energy systems**
  - Fundamental innovations in the pipeline over the next 5-15 years
  - Lessons learned from demonstration projects, large-scale deployments
- **Session III: Getting smart energy systems to scale**
  - Technical barriers and capacities
  - Value chain bottlenecks from lab to market
  - Standards, interoperability
- **Session IV: Policy, regulation and business models**
  - Regulatory issues, innovation and best practice
  - Emerging business models that need policy-maker attention

# Scaling up smart energy systems

- **Session I: Current status of smart energy systems**
  - Moderator: Russ Conklin, DoE
  - Peter van den Heede, ABB
  - Michael Hübner, ISGAN
  - Xavier Moreau, Schneider Electric

# Scaling up smart energy systems

- **Session II: Technology frontier for smart energy systems**
  - Moderator: Michele de Nigris, RSE, ISGAN
  - Marina Lombardi, ENEL
  - Rodolphe de Beaufort, GE
  - Regis Hourdouille, Ericsson

# Scaling up smart energy systems



- **Session III: Getting smart energy systems to scale**
  - Moderator: Rick Truscott, CLP
  - Javier Arriola, Iberdrola
  - Axel Strang, ERDF
  - Richard Schomberg, IEC

# Scaling up smart energy systems



- **Session IV: Policy, regulation and emerging business models**
  - Moderator: Jesse Scott, IEA
  - Sarah Keay-Bright, RAP
  - Karin Widegren, Swedish Energy Markets Inspectorate
  - Alicia Carrasco, Siemens

# Technology roadmaps provide answers

- **Where is technology today?**
  - GW installed capacity/kWh of savings
  - Leading countries/regions
  - Cost, efficiency
- **What is the deployment pathway needed to achieve 2050 goals?**
  - Use IEA Energy Technology Perspectives 2DS scenario
- **What are the priority near-term actions?**
  - R&D gaps and how to fill them
  - Identify barriers and obstacles and how to overcome
  - Market requirements and policy needs
  - Technology diffusion/transfer and international collaboration needs

# ...By building consensus among all stakeholders

- Goal to achieve
- Milestones to be met
- Gaps to be filled
- Actions to overcome gaps and barriers
- What and when things need to be achieved

# A new cycle of roadmaps can create a bridge to implementation



- **Proposed new cycle of roadmaps**
  - Global roadmaps, with more regional context & near-term action plans
  - A focus on national or regional roadmaps, supported by governments and key organisations
  - A closer look at how the roles of different technologies fit together
  - Stronger link to Tracking Clean Energy Progress publication

# Going beyond the page: turning words into actions



- Give short term guidance for meeting the long term vision by identifying the actions that can be taken today to keep on track with options open
- Be inclusive. Include the finance community and corporate strategists as well as engineers and specialists.
- Create “ownership” of the roadmap and its implementation by political and corporate partners to stimulate action on the ground

# Demonstrating success: Relevant actions that can be measured



- More regional specificity allows recommendations to be targeted to different conditions
- Track progress against metrics that are aligned with the overall objective (e.g. $/KWh instead of $, or % of kWh instead of MW)
- Regularly update roadmaps need to reflect changing economic, policy and technology conditions.

# Technology roadmaps provide an international consensus for roll-out of a given low carbon technology



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