



# Energy Innovation and Technology Transfer: Speed and Scale

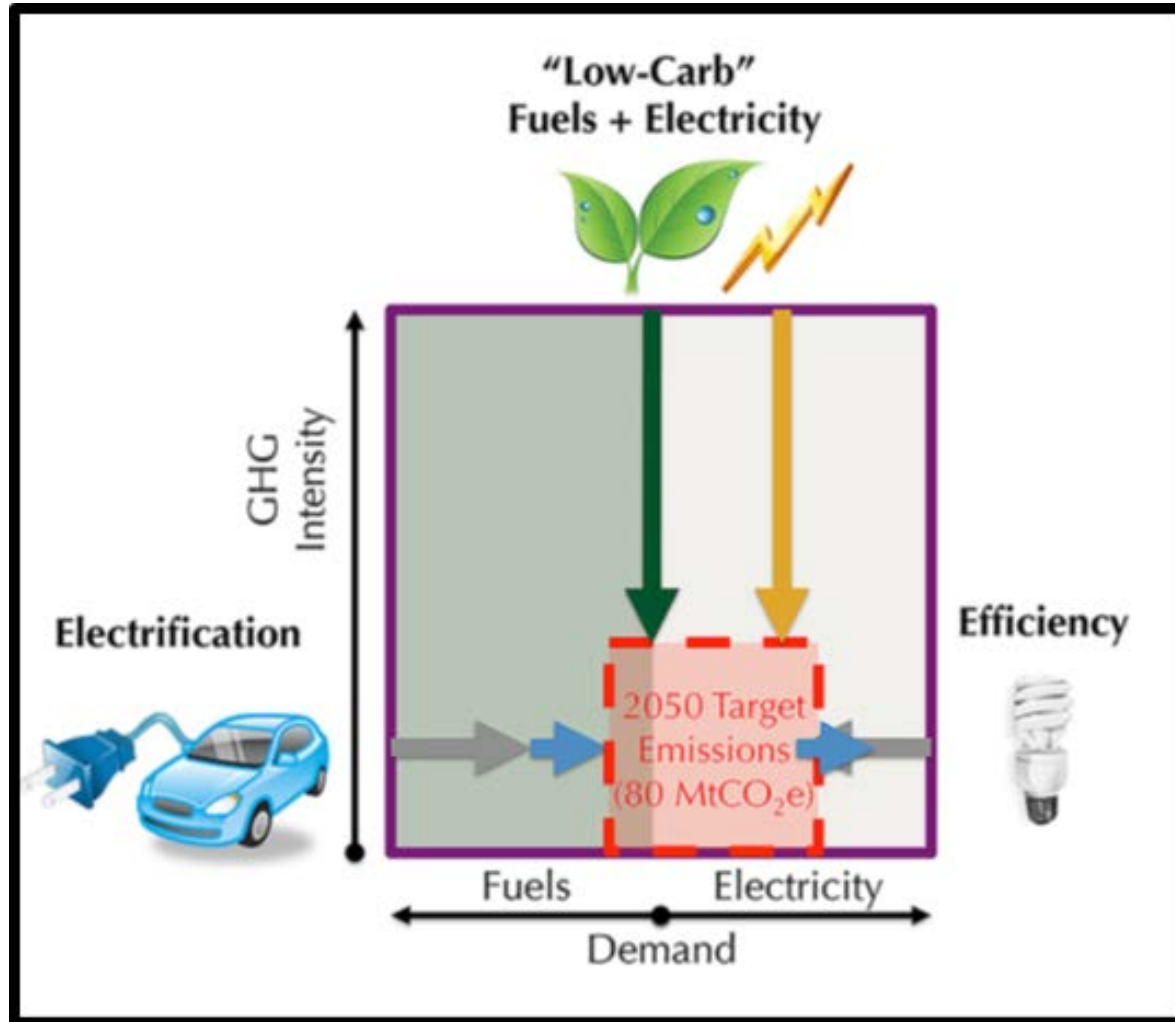
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21ST OSCE ECONOMIC AND ENVIRONMENTAL  
FORUM

2<sup>nd</sup> Preparatory Meeting

Kyiv, April 17, 2013

# Generalized Climate Strategy



# Accelerators

- Modular supply technologies

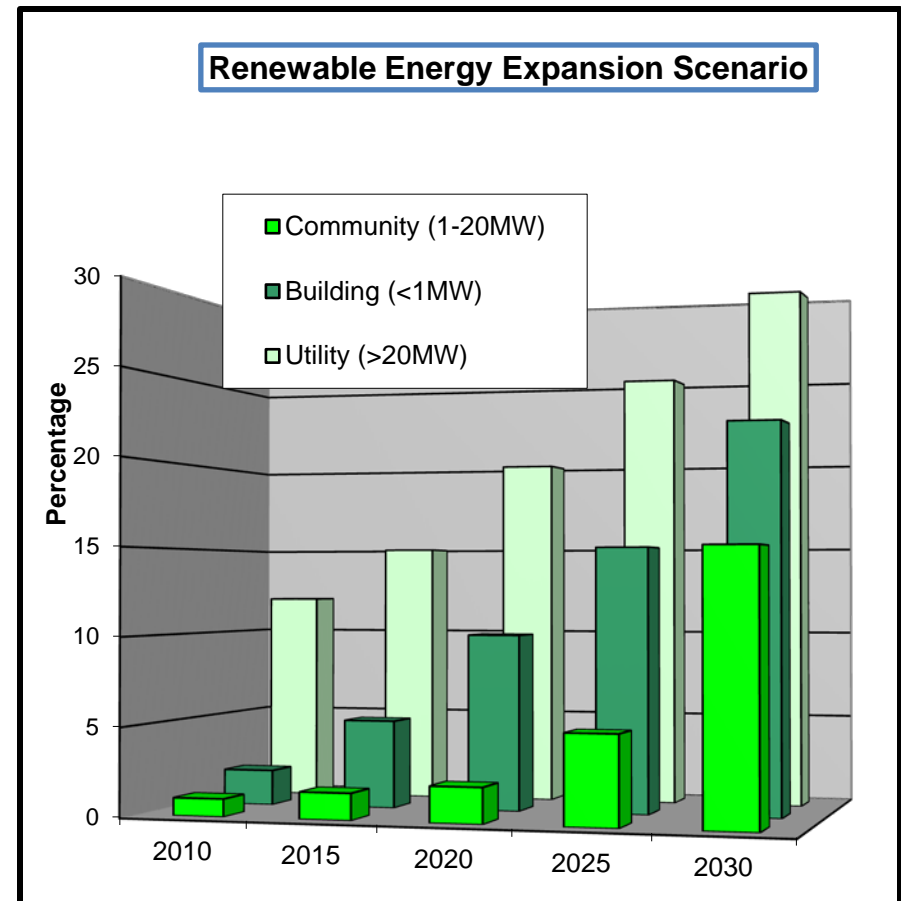
- Solar
- Wind



Predictable revenue streams enable solar and wind energy projects to attract low cost capital

# Energy Infrastructure Transformation

- Tactics
  - Add decentralized supply
  - Transform local infrastructure
- Metrics
  - Local investment in local resources
  - Local ownership and planning of smart infrastructure
  - **Net positive buildings and communities**



Source: IRESN, <http://iresn.org>

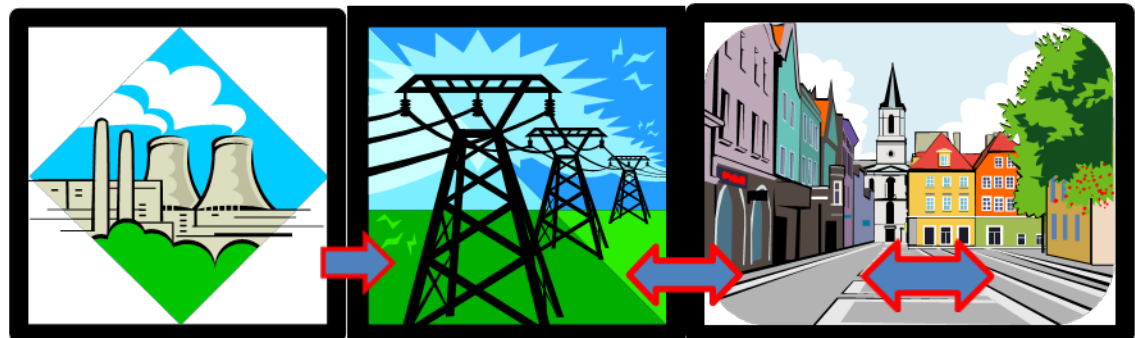
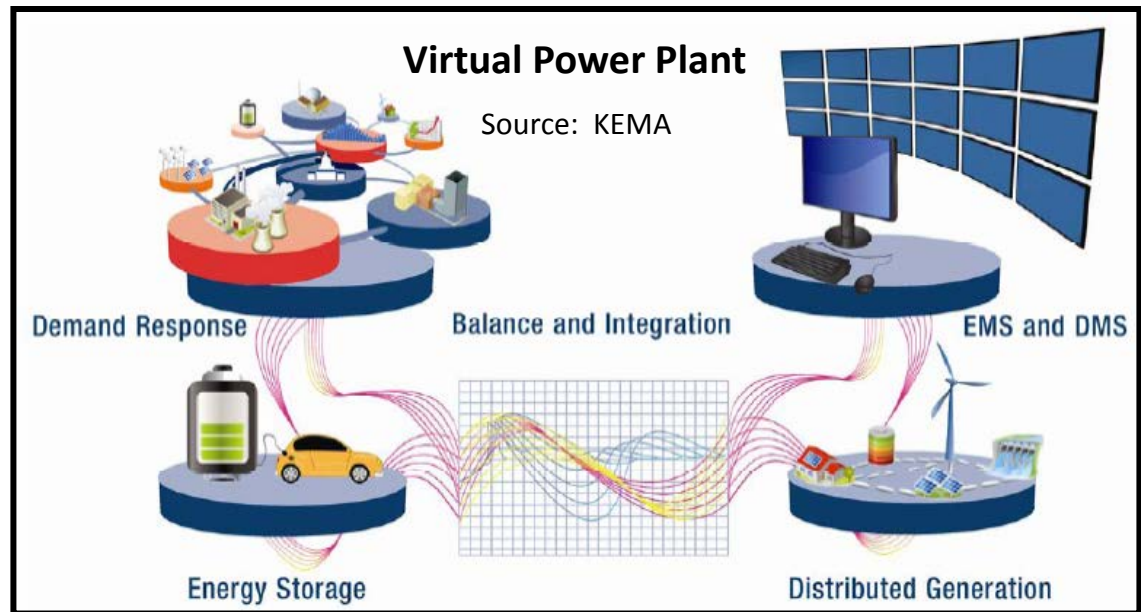
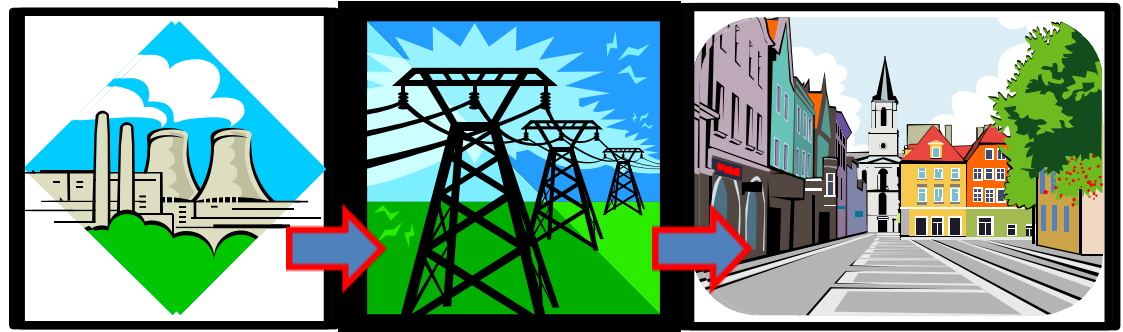


# Electricity Grid Innovation Drivers

- **Distributed and centralized electricity supply**
  - Bi-directional power flow at the meter and upstream
  - Pervasive “net” metering and “smart” meters
- **Actionable real time price information** (plus automated response at the point of use)
- **Energy user cost build-up:**
  - Supply and efficiency investments
  - Grid electricity and natural gas purchases
  - Virtual electricity and bio-gas purchases
  - Opportunity costs related to “use or sell” decisions
- **Policy emphasis on infrastructure modernization**

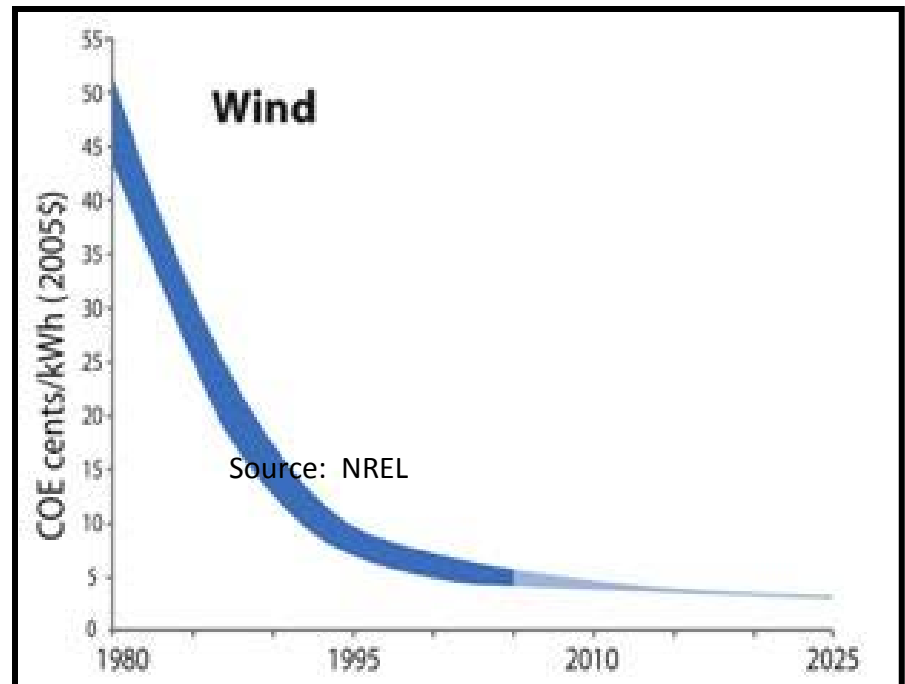
# Resiliency and Innovation Targets

- Local mini-grids and micro-grids able to purchase, sell and exchange electricity
- Infrastructure inter-operability
  - Electricity
  - Natural gas
  - Transport



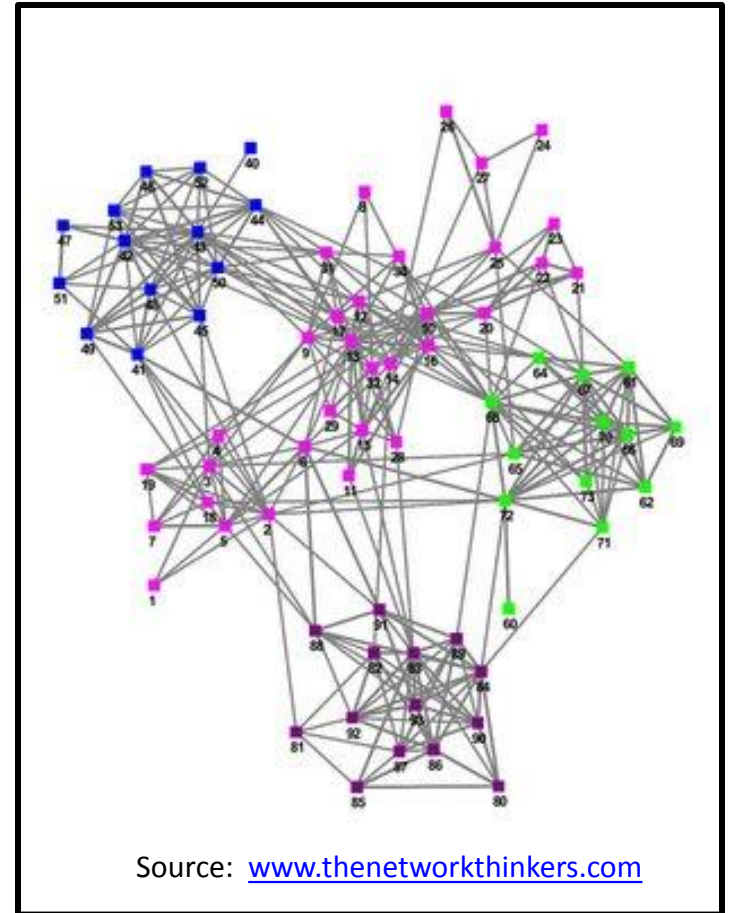
# Clean Energy Innovation

- Modular technologies are subject to incremental innovation as well as production scale economies. Large centralized projects typically are not.
- Replace energy monopolies with competitive structures. Innovation responds to need and requires attentive investment. Monopolists do not need to innovate and are poor stewards of innovation.



# Technology Transfer

- **Private sector competition** motivates healthy and focused interest in best practices and expedient collaboration. **Collaboration teaches.**
- Shared interests and vision motivate conversation. People are the most effective agents of technology transfer. Intentional **human networks** outperform conference industries.
- Public energy agencies and laboratories in the US face major technology transfer challenges.





# Summary

- **The pivot of our energy future is the city or community that integrates its information, energy, water and waste infrastructure for sustainable economic purposes.**
- Need for specialists and generalists to more quickly, completely and confidently understand one another. **Need for purpose driven human networks and educational transformation.**

# Thank You!

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