



Energy R&D in the ATN – targeting the big picture

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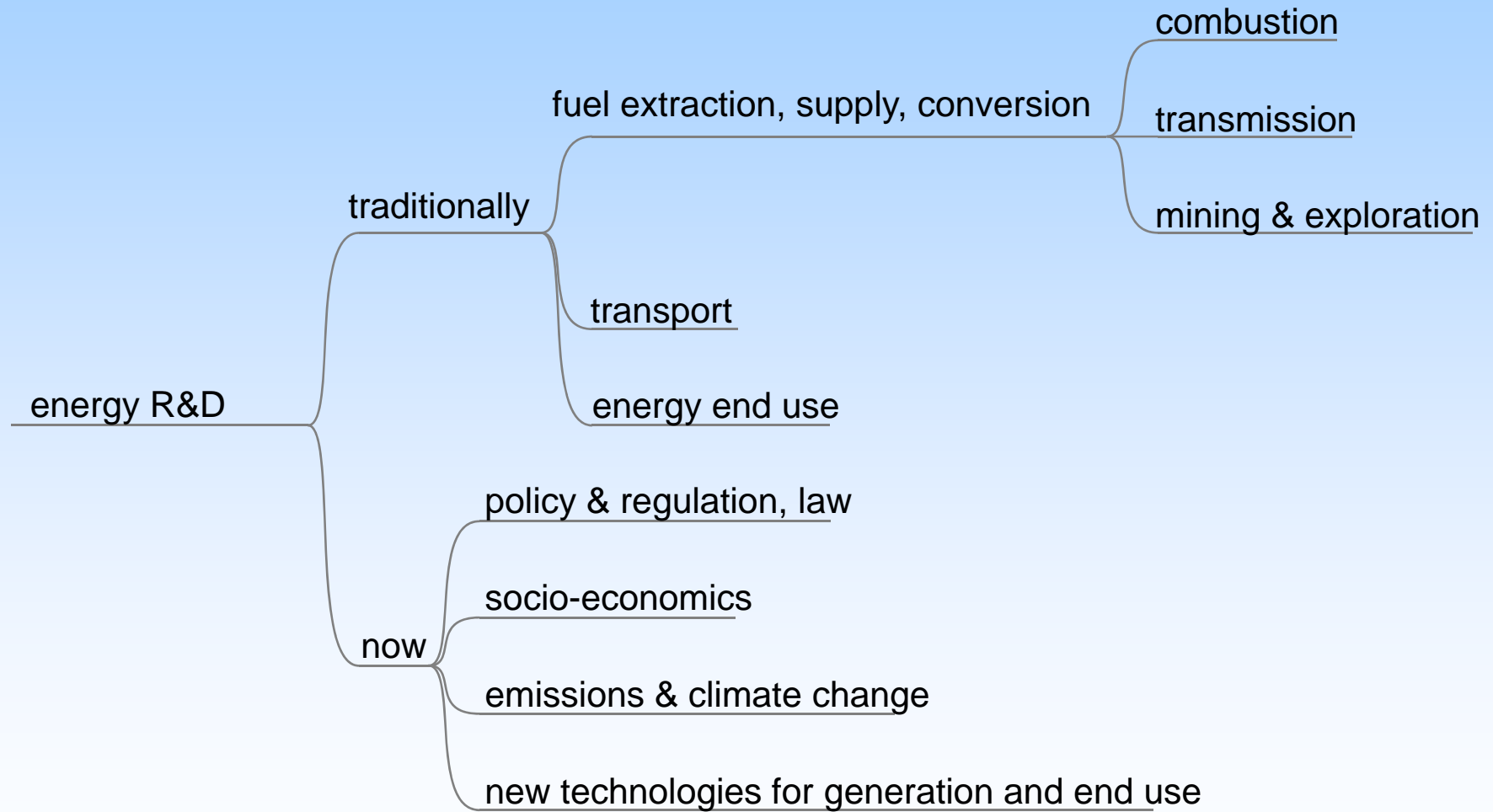
What is 'energy' R&D?



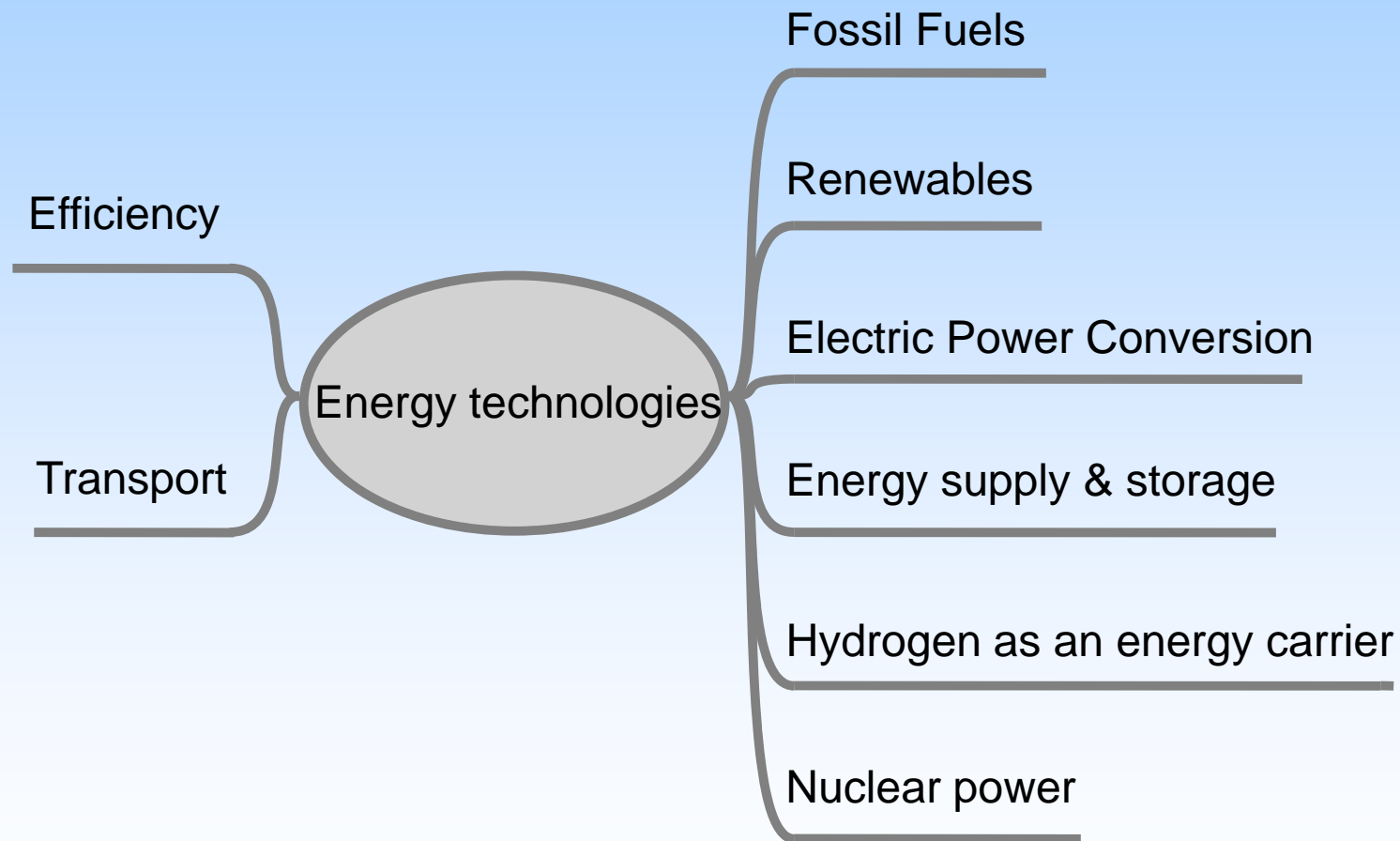
Figure 2. 125 MW array, Dimbach, Germany. Project Developer: Blitzstrom



What areas are included in energy?

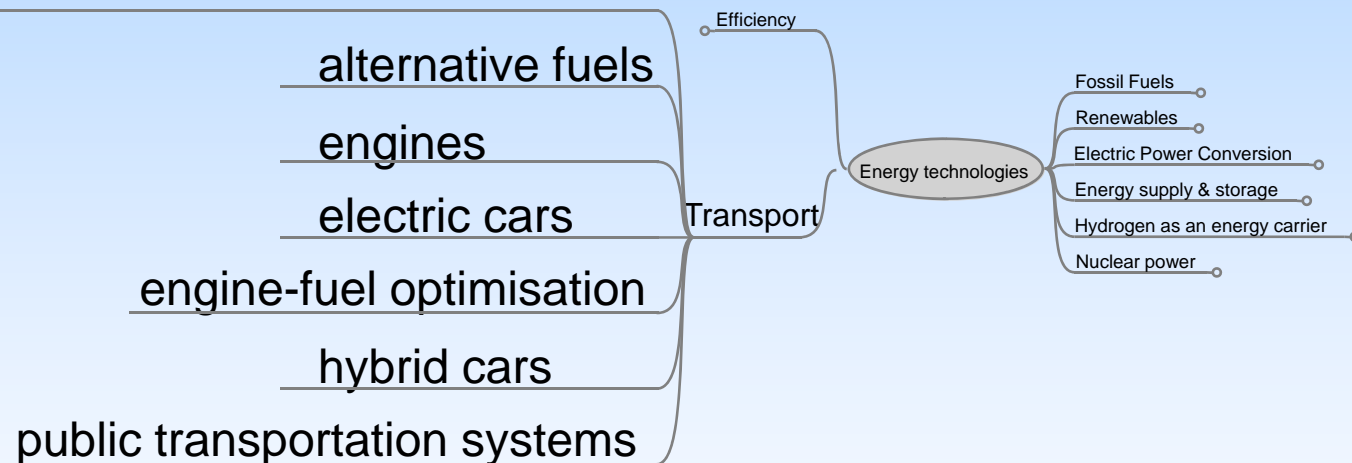


Energy technologies – a subset

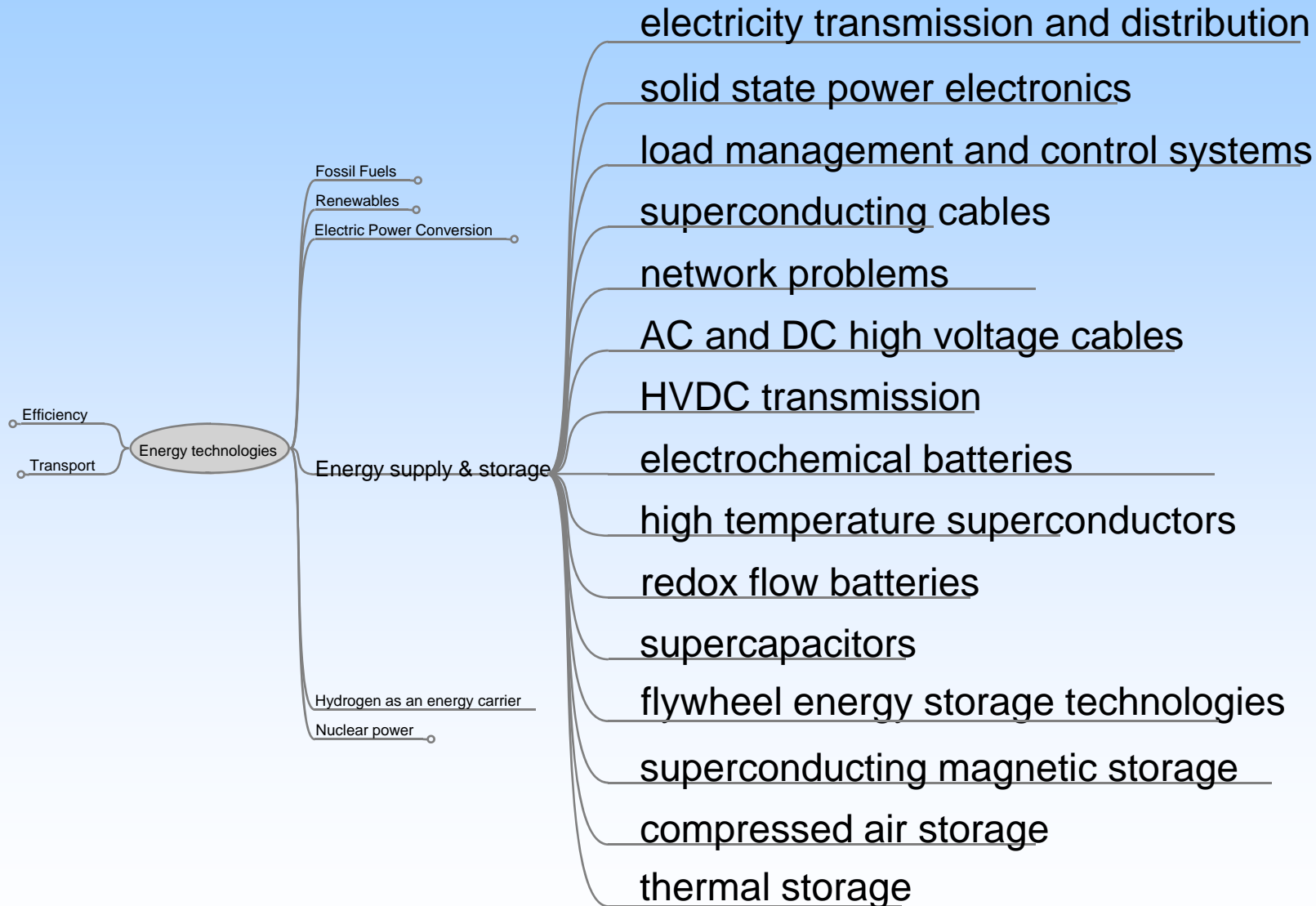


Energy technologies...

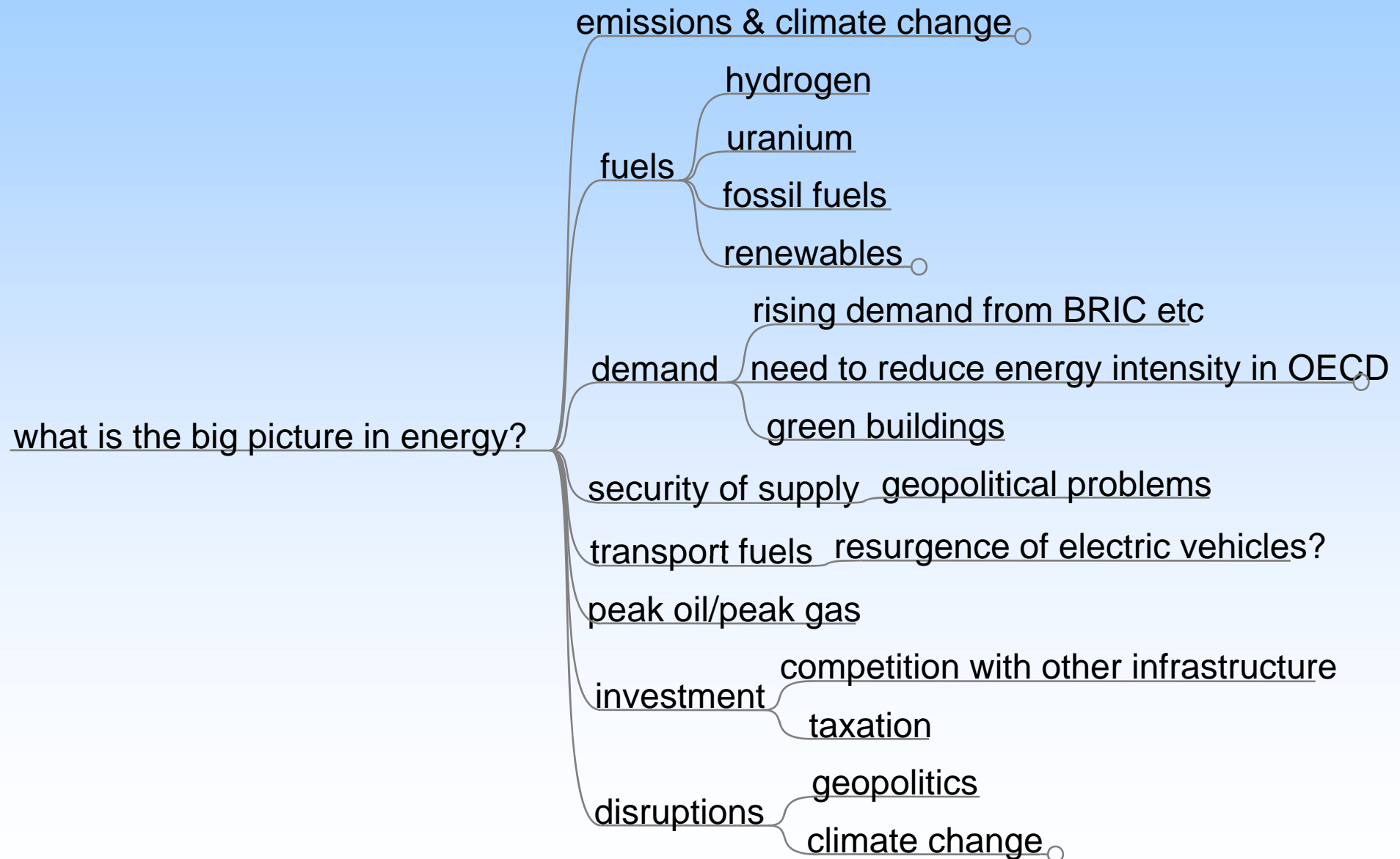
analysis and optimisation of
energy consumption in the transportation sector



Energy technologies...



What is the '*Big Picture*' in energy



Issues for Australia - I

- Technology leader or follower?
 - PV, SHW, energy storage,
- Rising international oil & gas prices
 - Diminishing transport fuels
- Our role as an energy supplier to our region
- CO₂ emissions from coal-based electricity
- Public acceptance of need to change
 - public/private ownership of electricity generation & transmission

Issues for Australia - II

- Small capital markets for new technologies
- Peak demand management
- Confluence of peak oil/gas with climate change
- Restructuring of transport, lifestyle, industry for reduced energy intensity

Who will fund the work?

- Industry, eg fossil fuel (Coal21), insurance,
- Governments
 - Federal...
 - States, eg NSW Climate Change Fund - \$100m/5 y
 - International, eg EU
- International agencies
 - eg World Bank
- Philanthropists
 - Branson, Gates, Buffet etc
- Universities
- CSIRO – eg Flagship Clusters

Some suggestions

- A new transport paradigm for Australia
 - The future of private vehicles - biofuels, hybrid, electric, plug-in hybrids etc
 - Resurgence in public transport?
- Diversifying from coal
 - Movement to gas, renewables, nuclear?
- Decline of centralised generation
 - DG, CHP, renewables, storage
- Green buildings
 - Technologies, policies, economics, habitat
- ?

What can the ATN offer in 'big-picture' energy?

- Expertise across all areas
 - Technology, engineering, science, socio-economics, policy, regulation, legal...
- Experience in working together, in partnership, across the country
- International partners
- The best students
- Good industry links
- ...

An example: CSIRO- ATN Intelligent Grid Cluster

- \$10m/3 y, 5 universities (ATN+UQ) + CSIRO
- Economic
 - Market and Economic Modelling of the impacts of DG and Local Co-operating agent based Demand Side Management (UQ).
 - Institutional Barriers, Stakeholder Engagement and Economic Modelling (UTS)
- Networks & technologies
 - Control methodologies of DG for enhanced network stability and control (UQ)
 - Optimal siting and dispatch of distributed generators (QUT)
 - The operation of DG in a mini grid (QUT)
- Social
 - Intelligent Grid Social Impact (Curtin)
 - The Intelligent Grid in New Housing Estates (UniSA)