Renewable Energy

Important considerations to make when planning RE projects

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REN21 Global Status Report on RE

Growing significance and geographical spread

SELECTED RENEWABLE ENERGY INDICATORS

	2007	2008	2009
Investment in new renewable capacity	104	130	150 billion USD
Renewables power capacity (including only small hydro)	210	250	305 GW
Renewables power capacity (including all hydro)	1085	1150	1230 GW
Hydropower capacity (existing, all sizes)	920	950	980 GW
Wind power capacity (existing)	94	121	159 GW
Solar PV capacity, grid connected (existing)	7.6	13.5	21 GW
Solar PV production (annual)	3.7	6.9	10.7 GW
Solar hot water capacity (existing)	125	149	180 GWth
Ethanol production (annual)	53	69	76 billion liters
Biodiesel production (annual)	10	15	17 billion liters
Countries with policy targets	68	75	85
States/provinces/countries with feed-in policies	51	64	75
States/provinces/countries with RPS policies	50	55	56
States/provinces/countries with bio-fuels mandates	53	55	65

Figure 12. Annual Investment in New Renewable Energy Capacity, 2004–2009

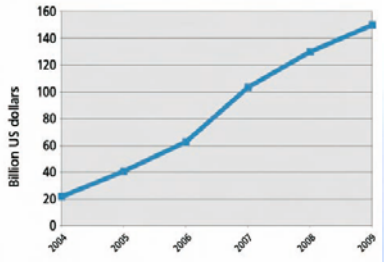


Figure 3. Share of Global Electricity from Renewable Energy, 2008

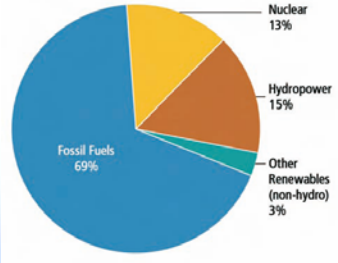
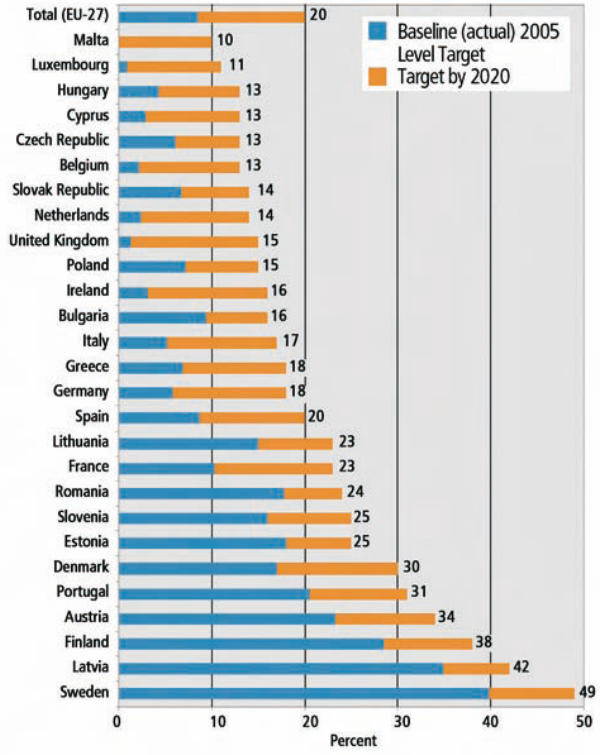


Figure 15. EU Renewable Energy Targets: Share of Final Energy by 2020



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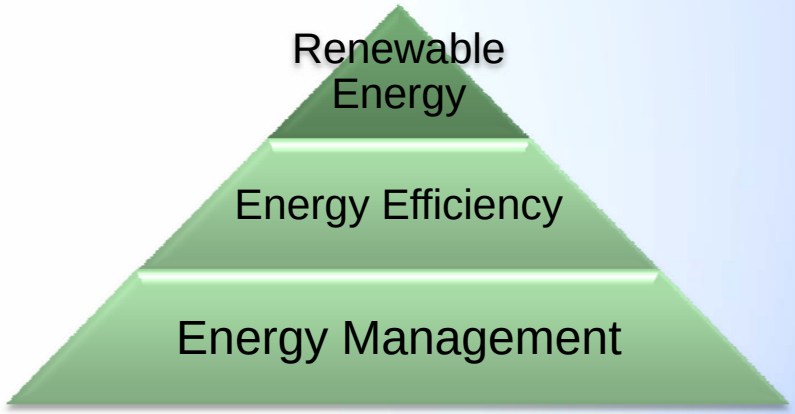
RE is not always low hanging fruits..

Many considerations to make early in the project planning process

- Resource availability
- Regulatory aspects
- Energy market assessment
- Environmental and social impacts
- Multiple stakeholders
- Infrastructure



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Resource availability

Development of RE will require

- Locally available energy source
- Access to reliable data
  - Hydrological data
  - Windspeed mapping
  - Solar radiation
  - etc
- Longevity of the energy resource
- Cross boundary issues affecting availability

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Regulatory aspects

Assessment to be made with regards to legal aspects

- Identify which laws are applicable to the project
  - Be aware of potential shortcomings in legislation for unconventional projects
- Land use regulations
- Water use rights (for hydro)
- Requirements to environmental and social impact assessments
- Emission permits required
- Policy incentives
  - Renewable energy tariffs
    - Timeframe of implementation
    - Risks of changes in policy incentives
  - Green certificate schemes
- Grid access

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Energy market assessment

Electrical energy

- Demand for electricity
- Distance to grid connection
- Cost of grid connection
- Is there a green certificate or feed in tariff scheme?

Thermal energy

- Where can the thermal energy be used to reduce traditional energy sources?
- Are there customers who would buy this energy?

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Environmental & Social Impacts

- Location of energy resources
  - Protected area?
  - Alternative use of resource being limited by the project in the future?
  - Other impact on communities in the vicinity
- Local pollution
  - Noise
  - Local gaseous emissions
  - Local particulate emissions
- End of life handling of project
  - Decommissioning of dams, rehabilitation of land
  - Solar PV handling

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Multiple stakeholders involved

- Project sponsor
- Equity investor
- Special purpose vehicle
- Lender(s)
- Multiple governmental bodies
- International organisations
- Often multiple contractors

<u>If CDM also:</u>

- CDM Consultant
- Independent third party
- Host country DNA
- CDM Executive Board
- Carbon credit buyer
- Buyer country DNA(s)

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Risks identification and allocation

Risks needs to be assessed and placed with the party best suited to mitigate them

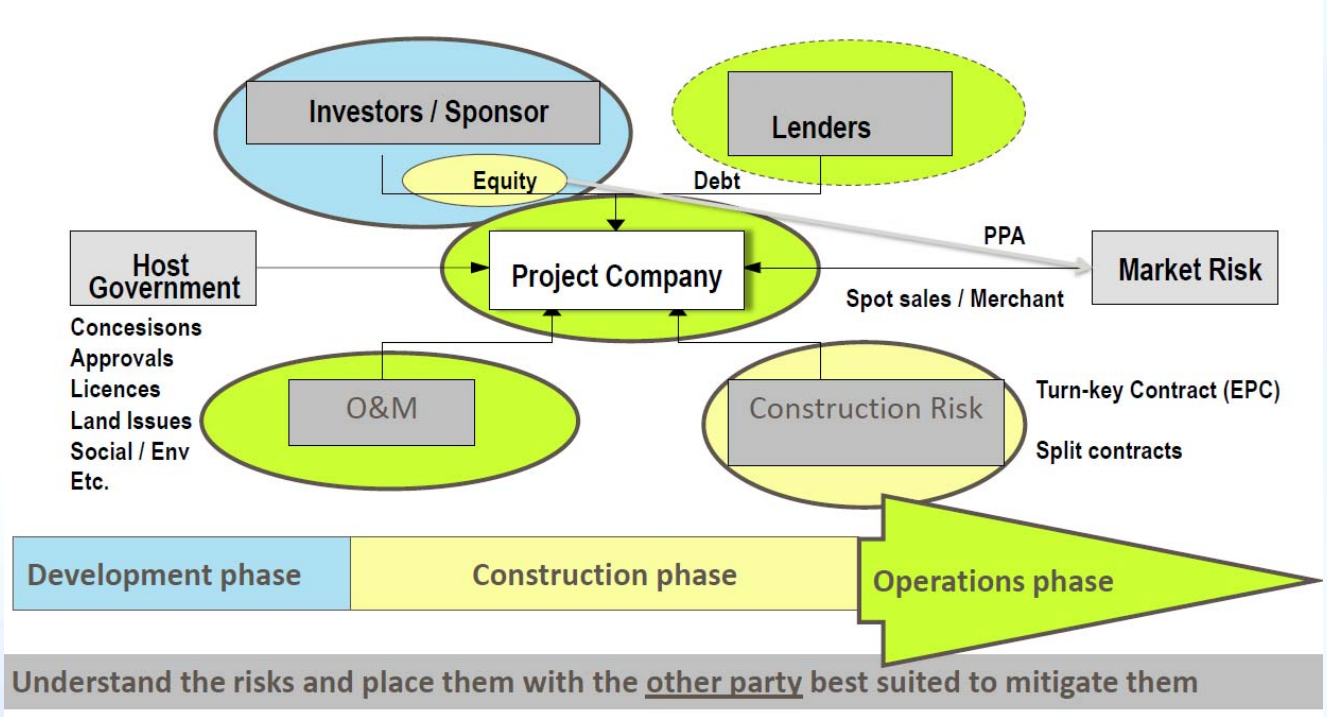

Figure sourced from SN Power

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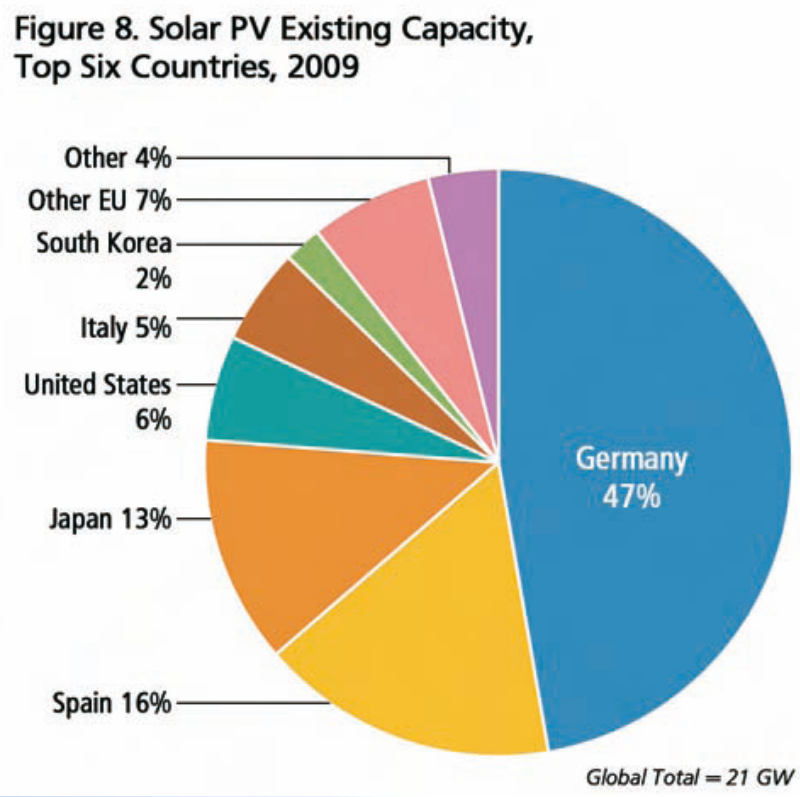
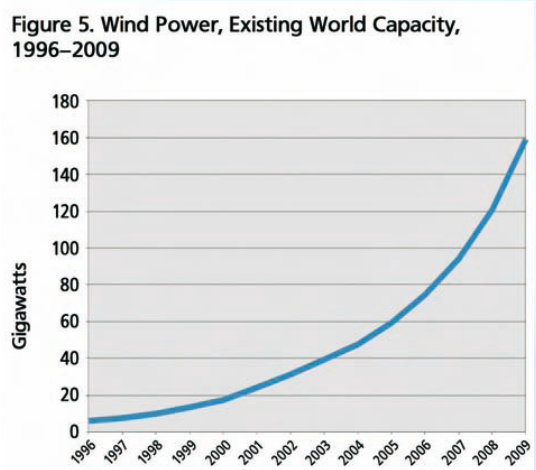
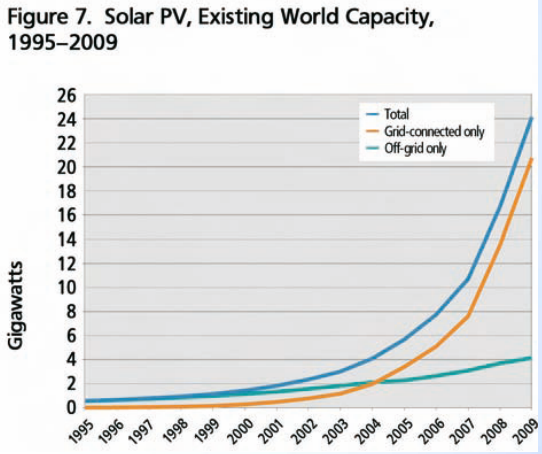
Some incentives apparently work..

RE fruits expected to hang lower in the future







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Thank you for your attention

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