



sustainable energy for everyone



Preparing for a renewable future

**IEA-RETD Workshop “Capitalizing on Renewables”
Short- and Medium- term Opportunities and
Economic and Employment Benefits**

27 September 2012, Ottawa, Canada
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Setting the scene

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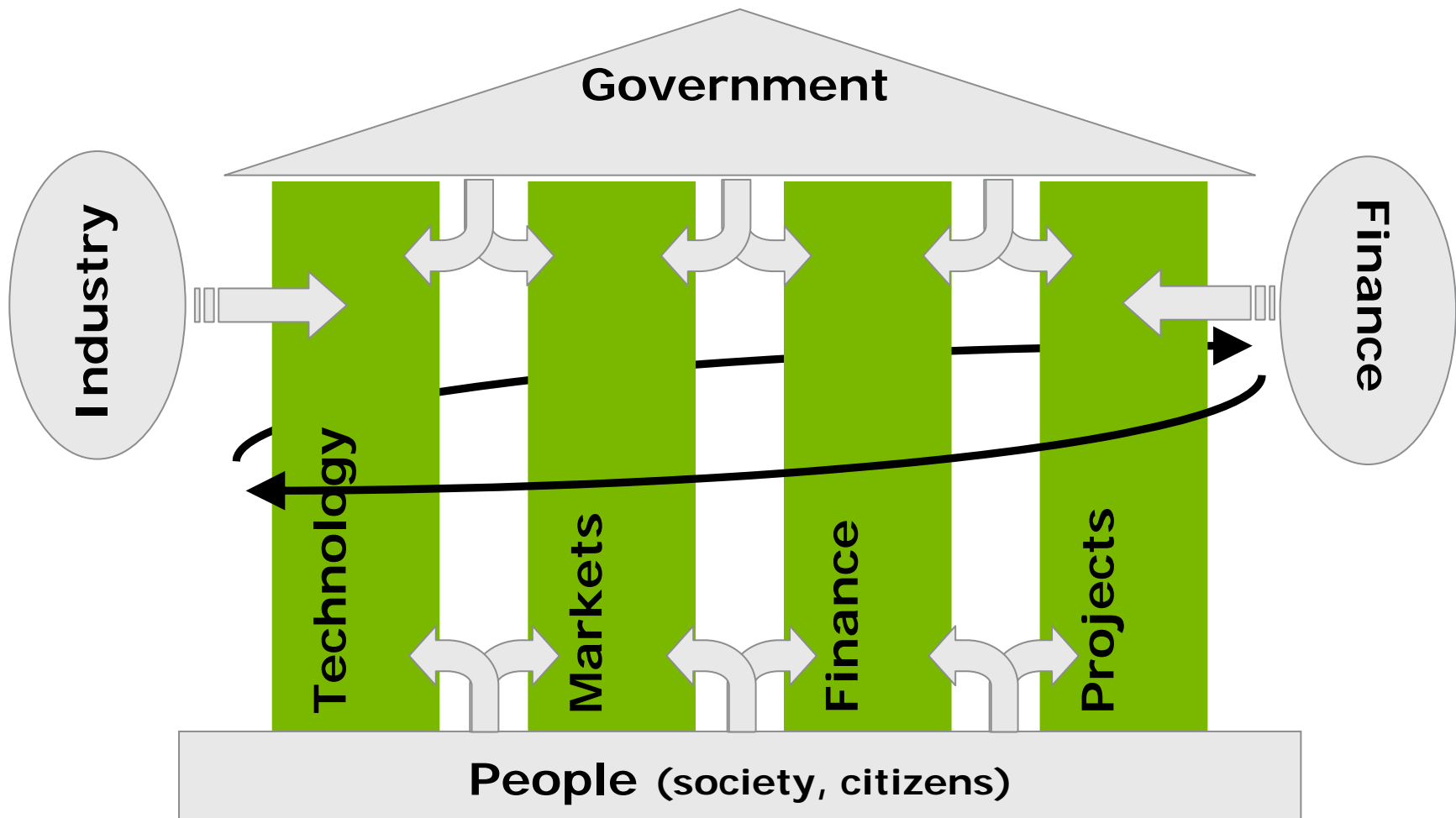
> Projects

New alliances for a renewable energy future

Setting the scene

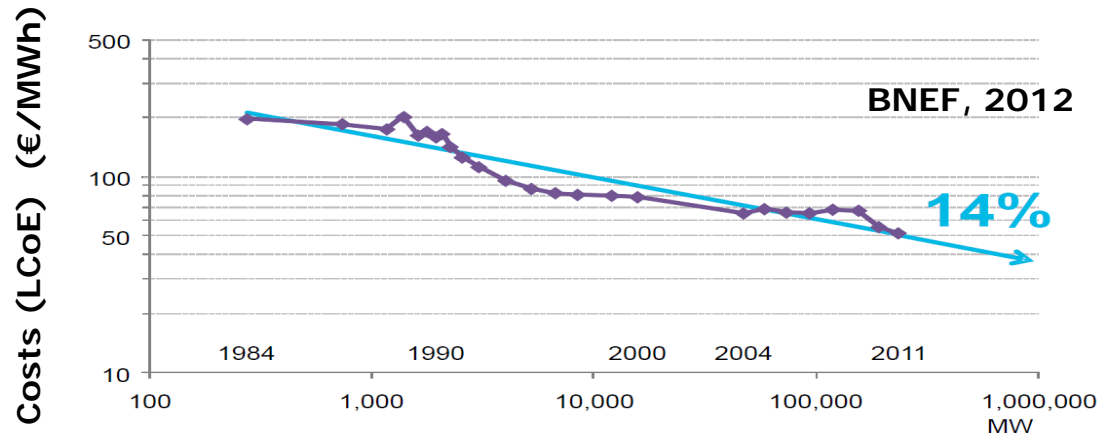
- > Megatrends are all still relevant
 - Megacities / city states
 - Role of electrification, e.g. in transport
 - Climate change inevitable
 - Compassionate capitalism in combination with limited number of very powerful multinationals
 - Management of boredom (10% of energy use related to leisure (direct+indirect))
- > Financial and economic crisis lingers on in multiple regions
 - Uncertain investment climate
 - Uncertain or tight government budgets in USA and EU
 - Green growth & job creation
- > Global power shift to BASIC (and other) countries
- > Information society develops further, but so far limited synergies with the world of renewable energy

Building the Renewable Future

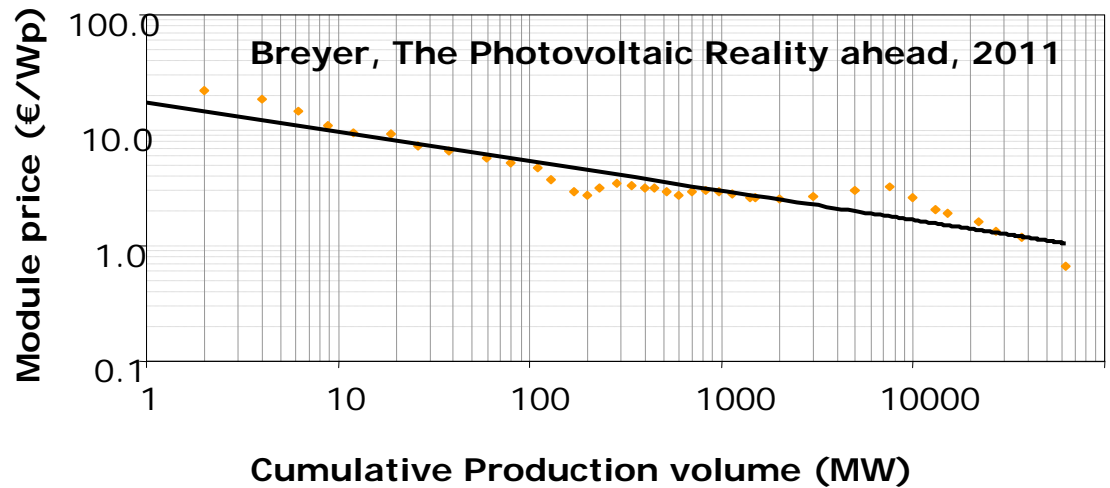


Technological developments: Fast decline of costs

WIND



SOLAR PV



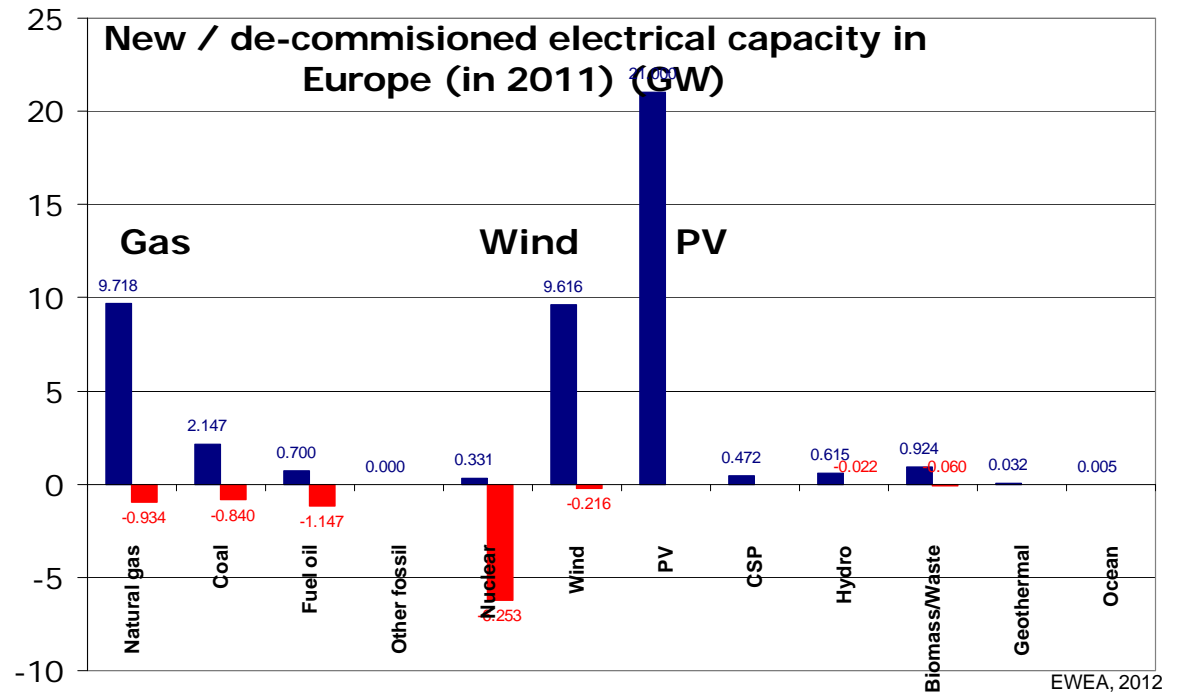
Technology

Market developments: Renewables

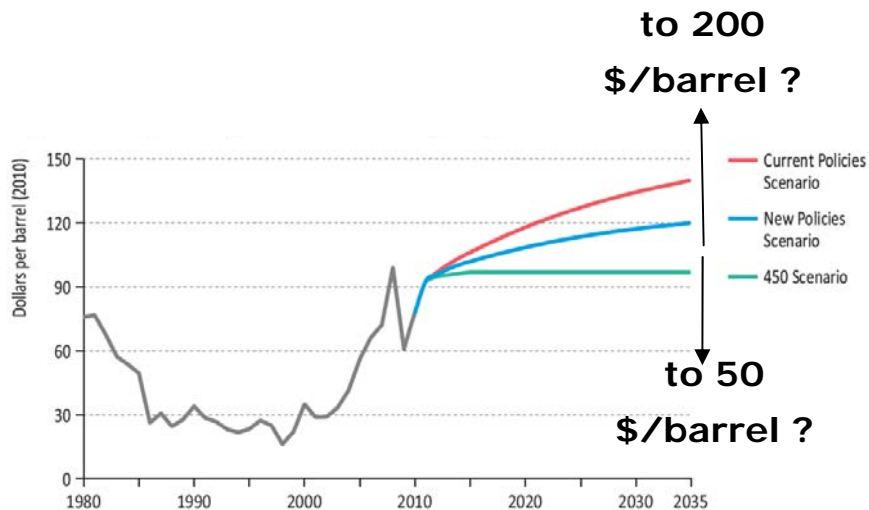
Renewables are mainstream

Newly installed electric capacity (2011)

- > World: 50%
- > Europe: 71%



Market developments: Fossil fuels

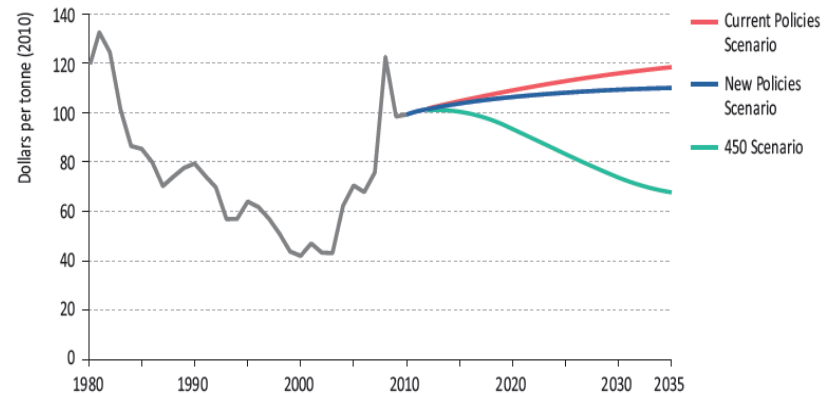


Crude OIL import price (USD/barrel) (IEA, WEO 2011) [IMF working paper]

Oil:
higher prices and
high price volatility

"a near doubling, permanently, of real oil prices over the coming decade"

Gas and coal:
Lower prices could
become a reality
(potentially at an
environmental cost)



STEAM COAL prices (USD/tonne)
in different scenarios (IEA, WEO 2011)

RENEWABLE ENERGY

Medium-Term Market Report 2012

Medium-Term Renewable Energy Market Report 2012

Didier Houssin
Director of Energy Markets and Security

Market Trends and Projections to 2017

© OECD/IEA 2012

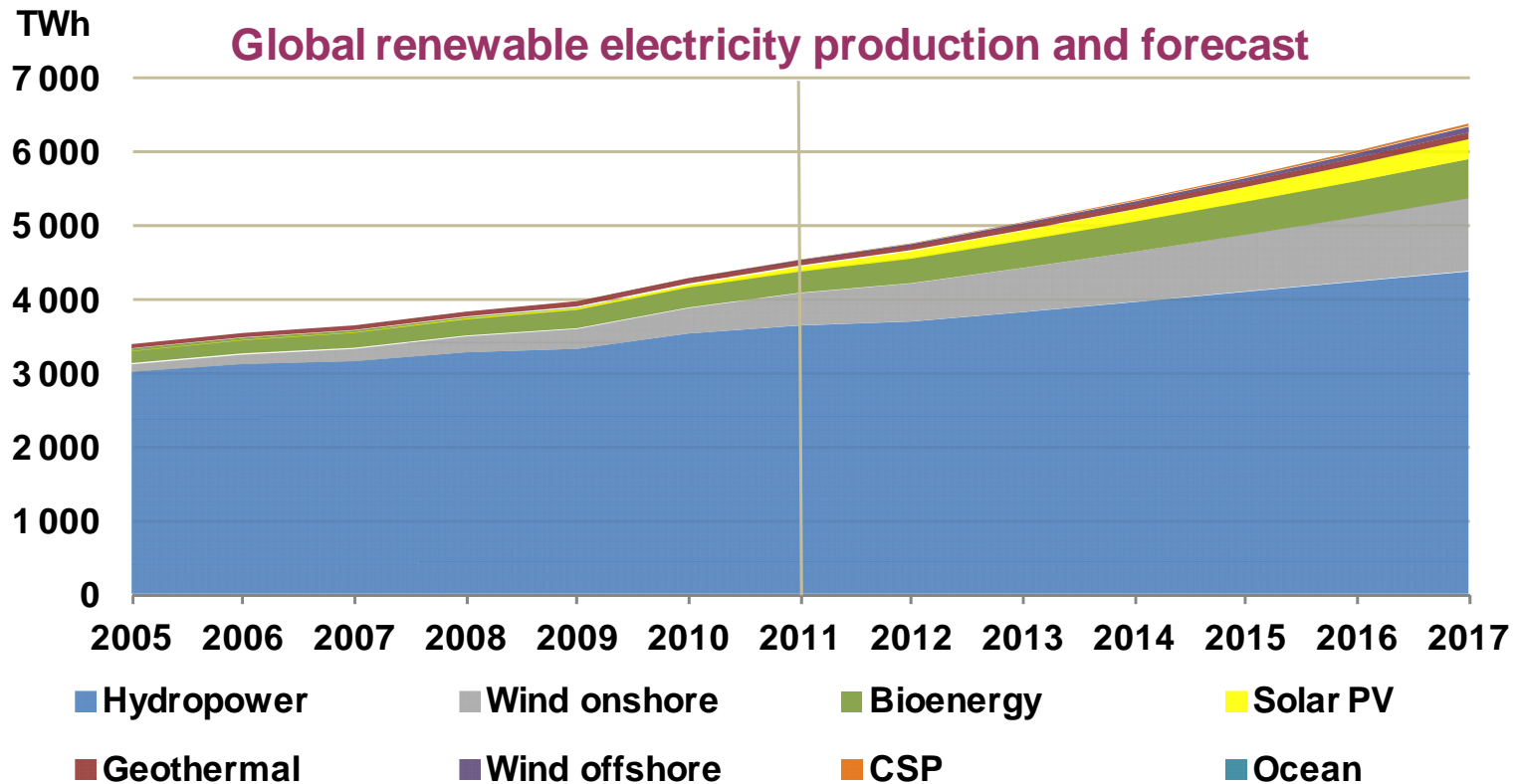
Key trends

(MRMR 2012, IEA)

- > As the portfolio of renewable technologies matures, global renewable power generation is forecast to increase 40% over 2011-17
- > This projected growth represents an acceleration versus the previous period
- > Renewable deployment is projected to spread out geographically, with increased activity in emerging markets
 - New deployment opportunities are spurring economies of scale in some renewable technologies, creating a virtuous cycle of improved global competition and cost reductions

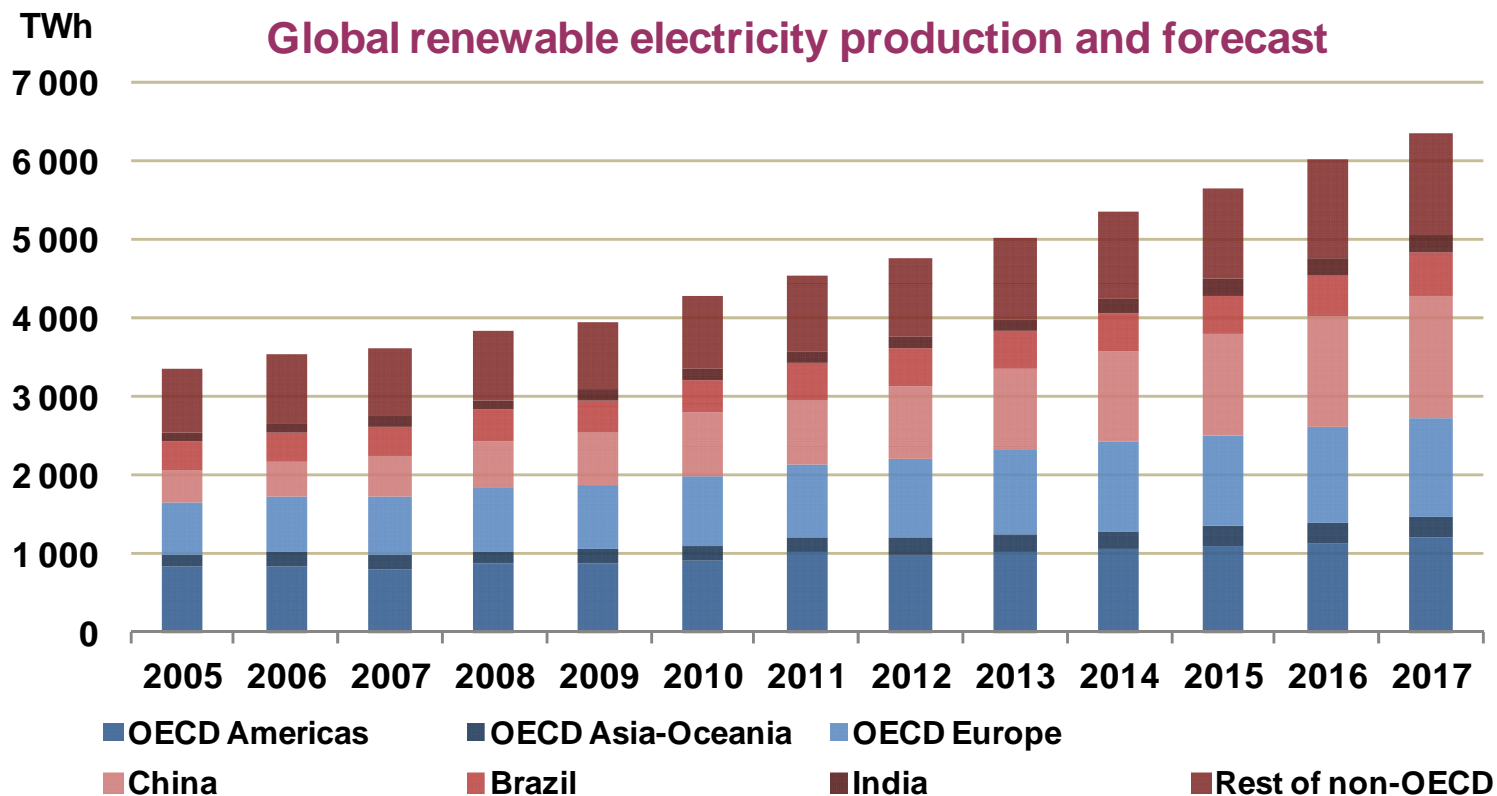
Growth in renewable power is forecast to accelerate (MRMR 2012, IEA)

- > Hydropower remains the main renewable power source (+3.1% p.a.)
- > Non-hydro renewable sources grow at double-digit annual percentage rates (+14.3% p.a.)



Growth is led by non-OECD countries (MRMR 2012, IEA)

- > Non-OECD accounts for two-thirds of the overall growth
 - China, Brazil, India lead; others grow significantly as well
- > OECD growth still largely driven by Europe but Americas and Asia-Oceania make significant contributions

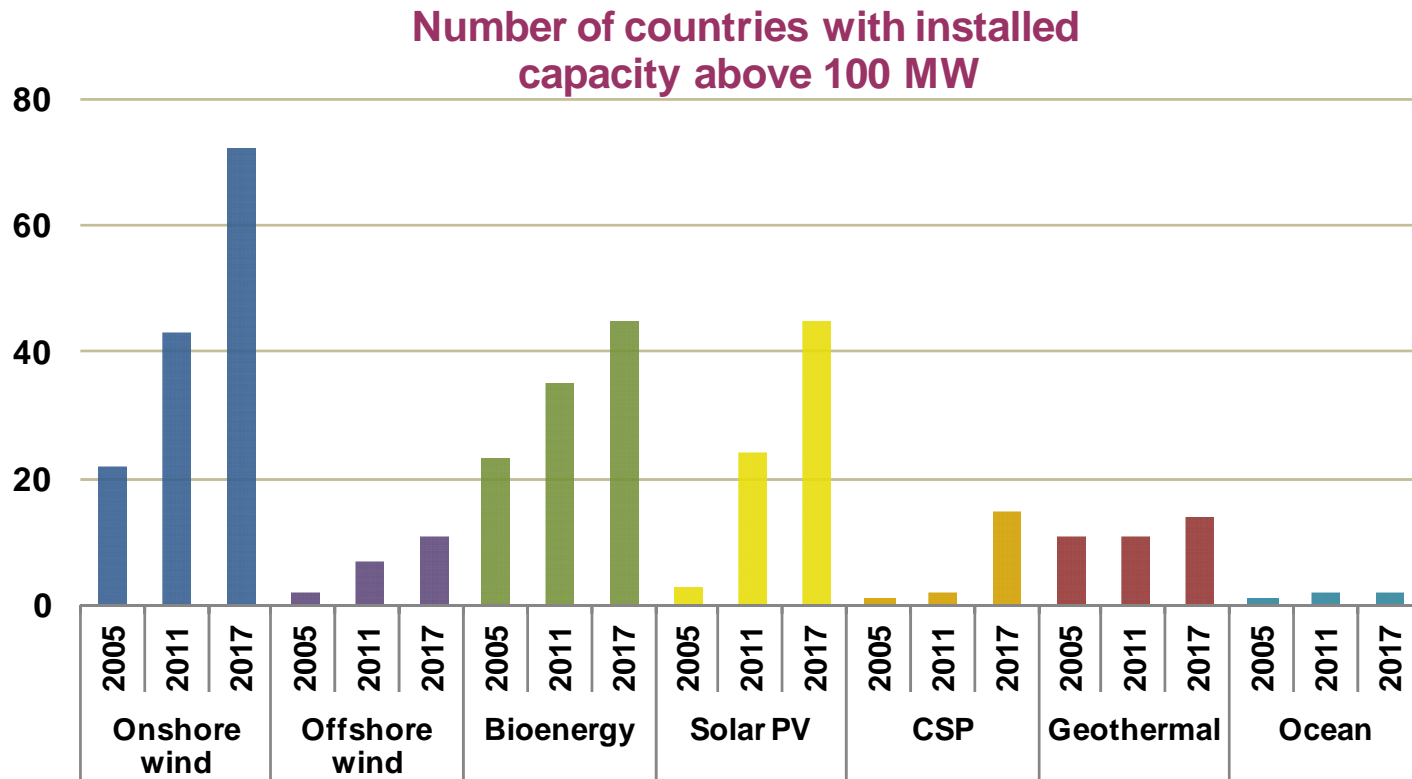


Non-hydro technology deployment spreads out

(MRMR 2012, IEA)

- > Number of countries with cumulative capacity larger than 100MW (can cover consumption of 100k households) increases significantly
- > Growth areas include Asia, Africa, Latin America and the Middle East

Markets



Market developments - Conclusions

- > Continuous investment in renewable energy
- > Good developments in bio-energy
- > Price drop of solar PV will lead to a revolution in the energy markets
- > Wind energy develops very well
- > Industry expectations exceed IEA projections
- > Strong impact of **1000 GW PV and 1000 GW wind in 2020**
 - Substantial part of average load of 3000 GW in 2020
 - Concept “base-load” becomes obsolete
 - Changed economics for new “base-load” power: coal, biomass, CCS, nuclear (reduced full load hours)

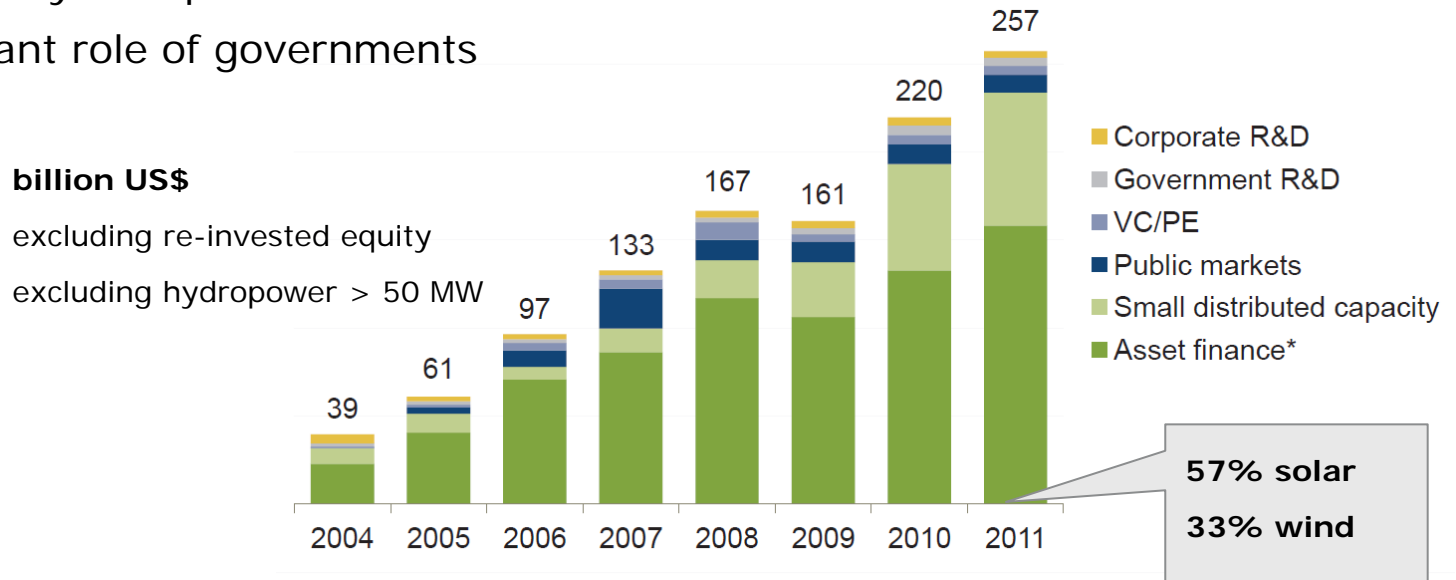
Finance developments

Growing investments

- > 257 billion USD (+17%) investments in 2011 globally

Challenges

- > Cost of capital
- > Availability of capital
- > Important role of governments



Pipeline of projects

- > More projects needed (permitting, NIMBY)
- > Speed up the project development phase
- > Improved quality of projects (bankability)
- > Aggregation of smaller projects for attracting institutional investors

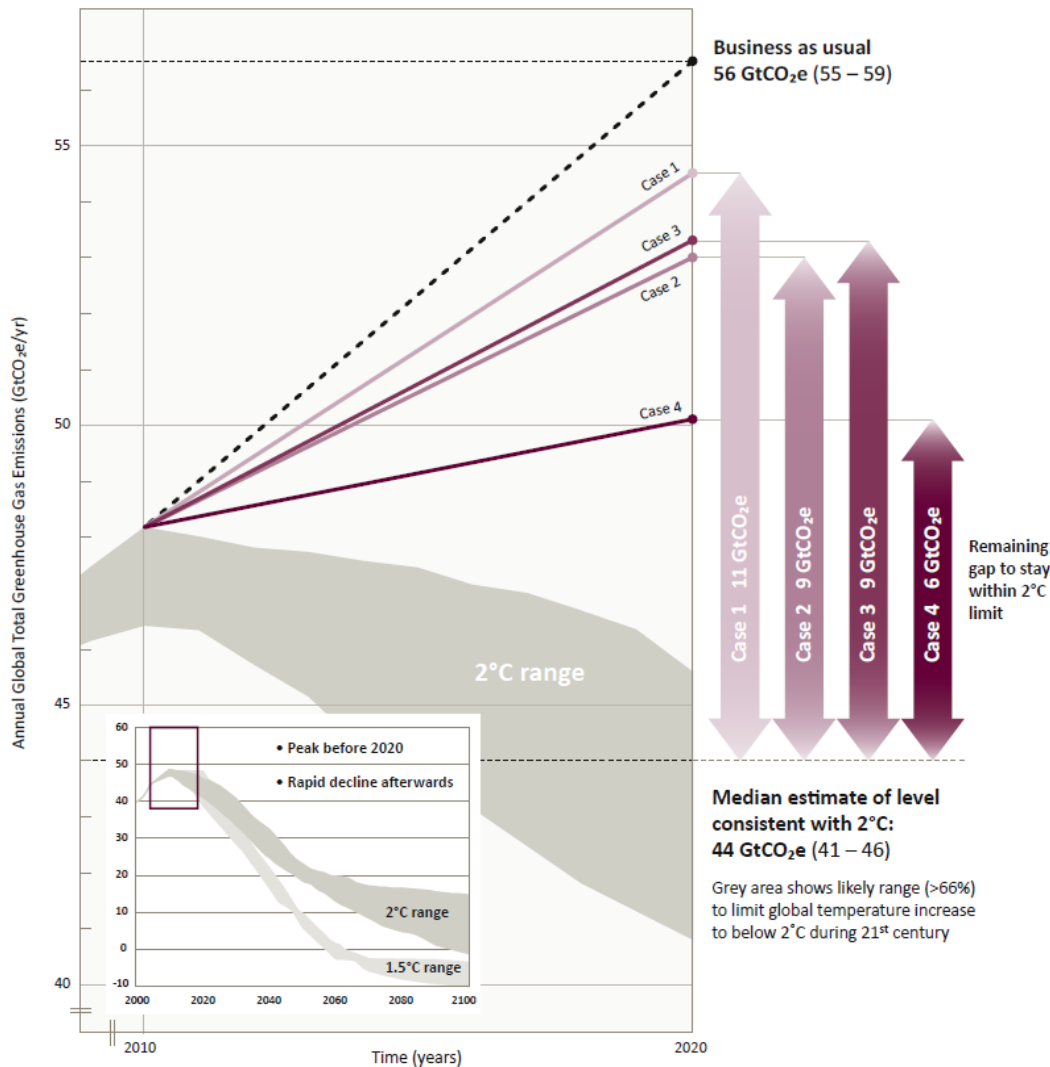




Government

- Externalities are not yet fully internalised in energy prices
- Occupied with economic, financial and monetary crises
- Climate change remains a big threat, but international response weak
- Policy developments are modest

The emissions gap



Governments agree on the importance of a 2 °C trajectory, but fail to take up appropriate commitments

- Case 1 – Unconditional pledges, lenient rules**
If countries implement their lower-ambition pledges and are subject to “lenient” accounting rules, then the median estimate of annual GHG emissions in 2020 is 55 GtCO₂e, within a range of 53 – 57GtCO₂e.
- Case 3 – Conditional pledges, lenient rules**
Some countries will be more ambitious with their pledges. Where this is the case, but accounting rules are “lenient”, median estimates of emissions in 2020 are 53 GtCO₂e within a range of 52 – 55 GtCO₂e. Note that this is higher than in Case 2.
- Case 2 – Unconditional pledges, strict rules**
This case occurs if countries keep to their lower-ambition pledges, but are subject to “strict” accounting rules. In this case, the median estimate of emissions in 2020 is 53 GtCO₂e, within a range of 52 – 55 GtCO₂e.
- Case 4 – Conditional pledges, strict rules**
If countries adopt higher-ambition pledges and are also subject to “strict” accounting rules, the median estimate of emissions in 2020 is 51 GtCO₂e, within a range of 49 – 52 GtCO₂e.

Source: Bridging the emissions gap, UNEP, 2011

Stakeholders



Government

- Externalities are not yet fully internalised in energy prices
- Occupied with economic, financial and monetary crises

Industry

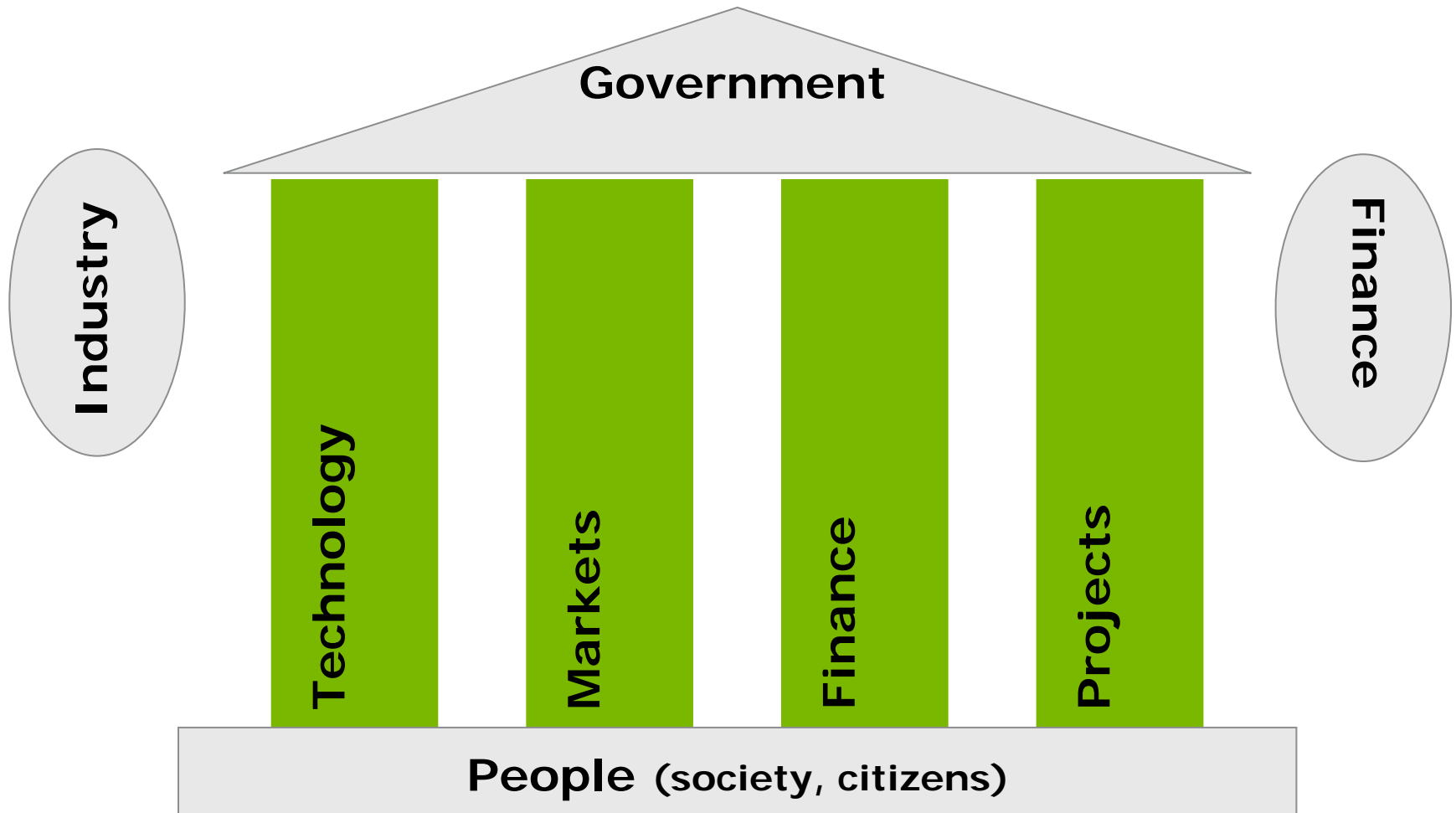
- Utilities need to adapt to the new reality of *'prosumers'*
- Business case for 'baseload' affected
- No longer main investors
- Currently not (well) functioning
- New financiers needed
- New models needed?

Finance

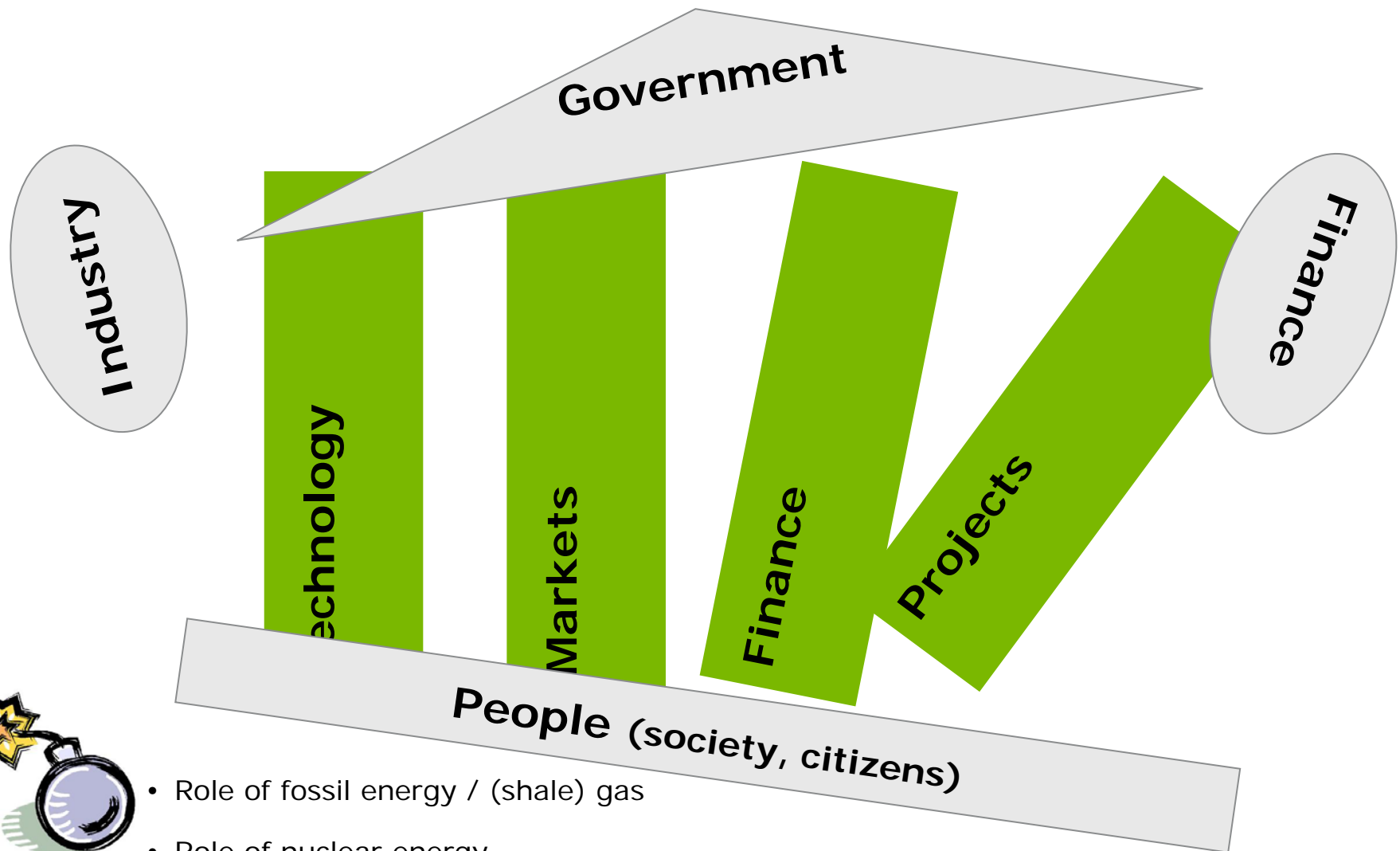
People (society, citizens)

- Part of the problem (NIMBY, misperceptions)
- More decentralised energy = more NIMBY ??
- Part of the solution? As financiers, as project developers.

Renewable energy deployment



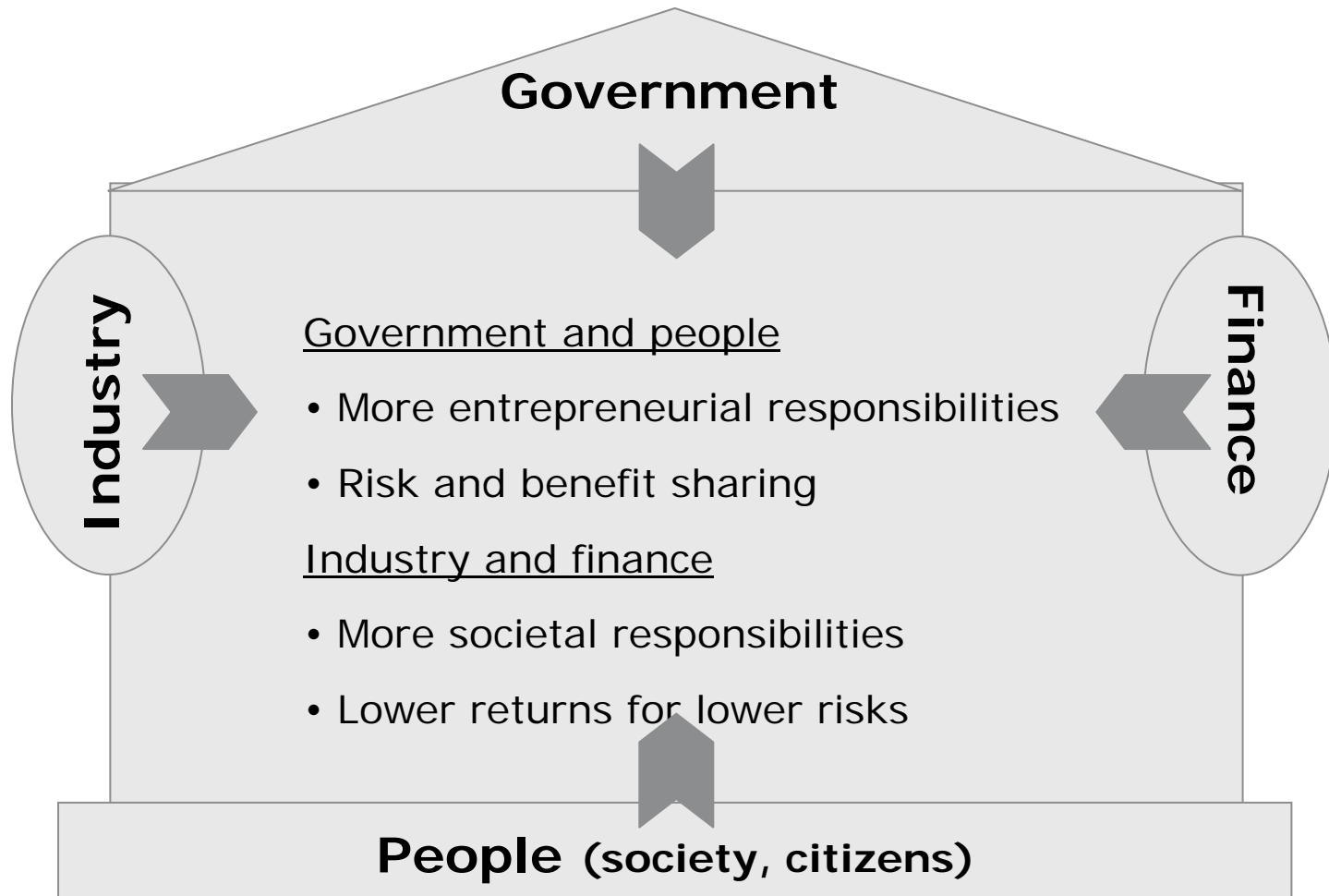
Renewable energy deployment – At risk?



New alliances for a renewable energy future

Economic growth

Job creation





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