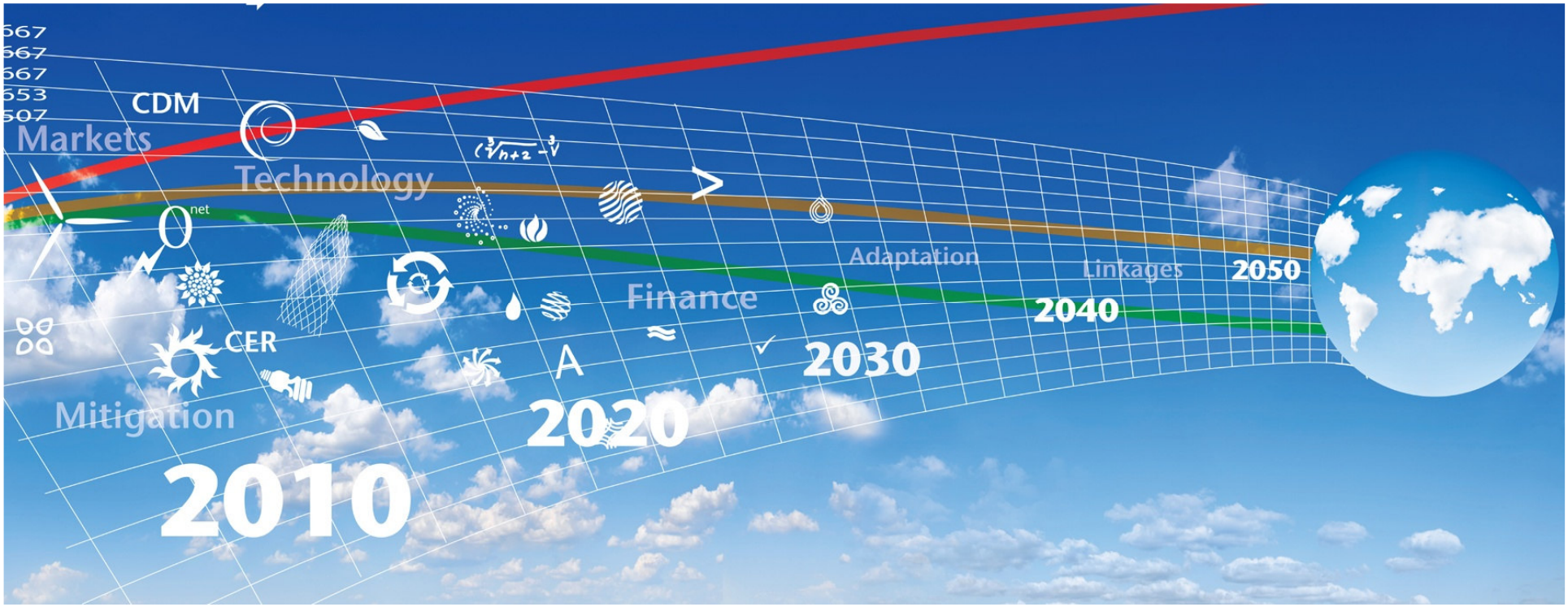


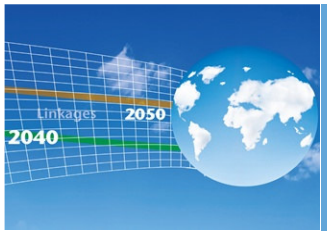
Electricity and climate mitigation

Helle Juhler-Verdoner

Alstom

wbcsd electric utilities

Electricity Utilities project

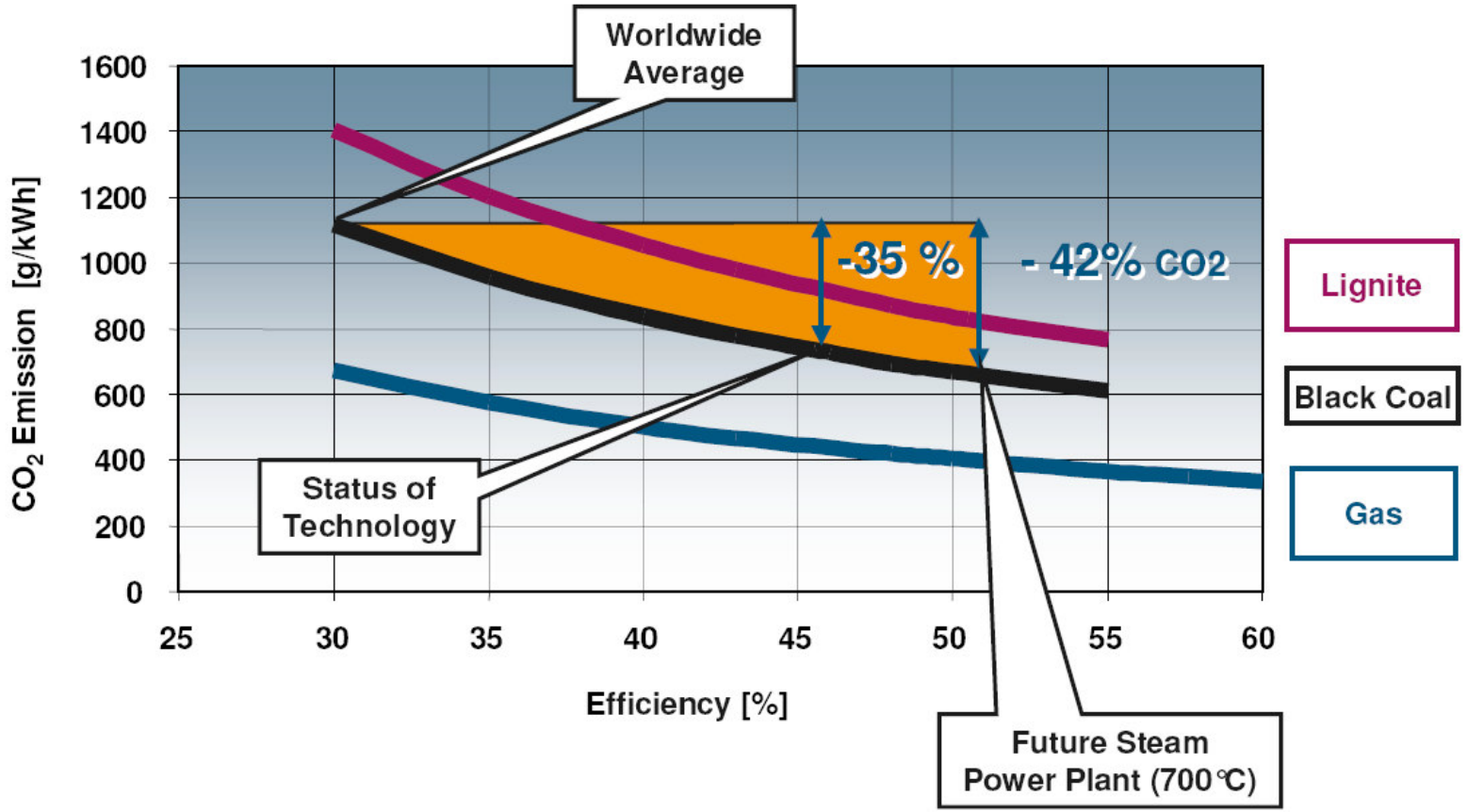


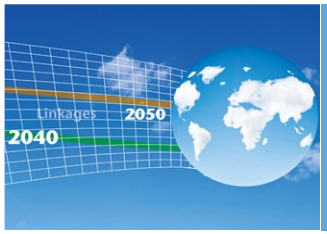
Early retirement of coal fired generation

- ✓Coal-fired electricity generation contributes a large – and growing – share of global CO2 emissions.
  - ✓73% of CO2 from global power generation
  - ✓30% of total global CO2 emissions from energy
- ✓IEA WEO 2010's 450 ppm scenario:
  - ✓300 GW of new built coal plants between now and 2035 will be retired before end of their technical lifetime
  - ✓Around 100 GW will be retired before achieving commercial return
  - ✓Net loss of **USD 70 bn or 28% of the investment cost**
- ✓Alternatives to early retirement exist:
  - ✓**Retrofitting existing plants with more efficient boilers & turbines**
  - ✓**Carbon Capture and Storage**

SPBC: System Public Benefit Charges

How new technology improves energy supply efficiency and reduces CO_2 emissions





Significant CO2 savings could be made

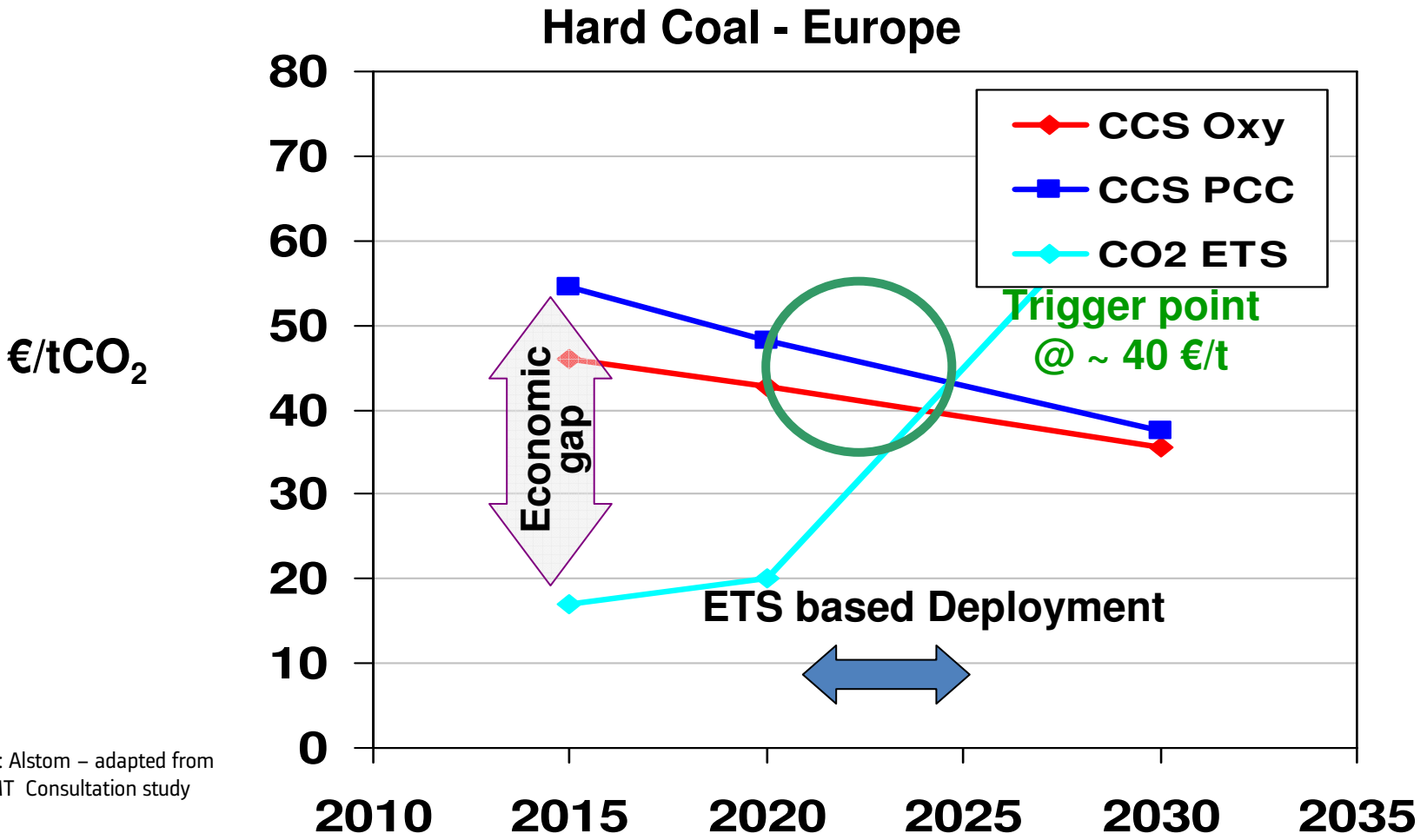
- Even a modest effort to improve efficiency levels could deliver significant CO2 savings.

- E.g. if, **hypothetically**, Europe were to:
  - **retrofit** those **coal plants** aged between 20 and 30 years to improve their efficiency by 3.5 ppt,
  - install BAT on **all new coal plants** ordered now for construction by 2020,
  - **re-power** those **gas fired boiler** plants aged between 20 and 30 years,

then

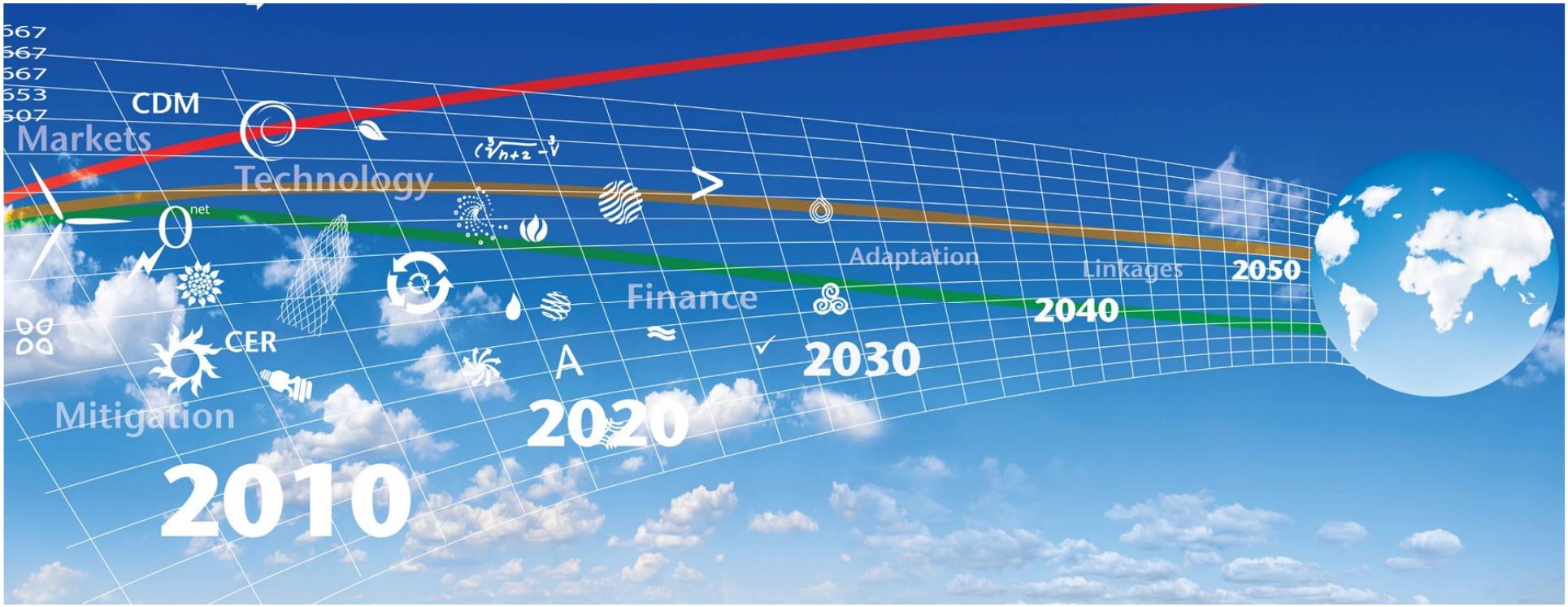
by 2020 annual power sector **CO2 emissions** would fall by 29**m** tonnes a year, equivalent to **12% of EU ETS emissions reductions required by 2020.**

CCS Funding: further support needed



Source: Alstom – adapted from UK HMT Consultation study

Funding, financing and/or FITs needed in the short and medium term. Including for the current demonstration projects.



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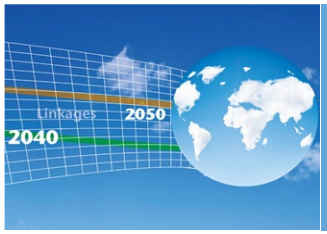


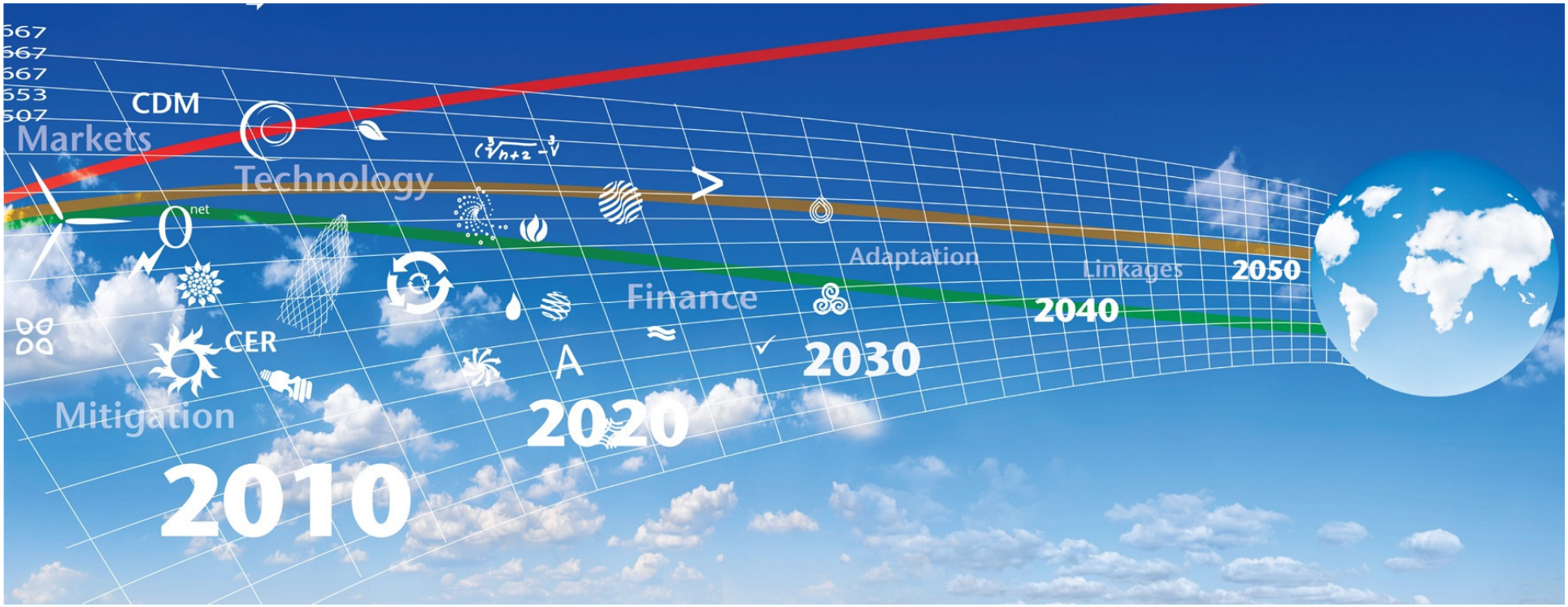
Demand-side Energy efficiency

1. Important to address end-user-demand inefficiency

   Policies must be adapted to local circumstances (several options)

2. Options also need to address lack of up-front capital

   Why do households not implement cost-effective EE?
   Can ESCOs or utility programs work?



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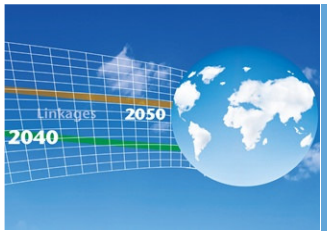


Electricity market design for decarbonisation

✓All investments need **predictability on financial reward and certainty on the policy framework**

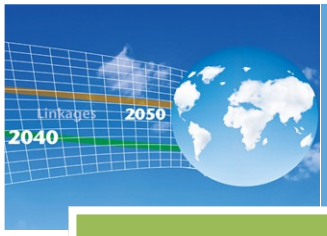
- •delays in policy decision increase electricity prices by 13% (2010-2020, Australian survey)

✓ Incentivising low-carbon investments

- ✓**Market-wide intervention** (carbon pricing and regulation) better than creating **separate markets** (quantified obligations regulator)

✓Market structures and low-carbon power generation – The real issues are:

- ✓Most REs unable to store electricity and fluctuate significantly. Need for back-up capacity
- ✓How to reward back-up and fund development of smarter grid?
- ✓Support all low-carbon technologies equally - will limit the problem!



Electricity project recommendations*

Every country should introduce policies that realize the potential energy savings through higher efficiency throughout the electricity value chain: generation, grids and end use

Generation

✓Focus on bringing a convincing cost perspective (including capacity building and access to capital) for:

- ➢**utilizing** the **highest efficiency technologies** for all new plant construction
- ➢**restoring design efficiency** in existing plants.

✓E.g Arnot case (South Africa) and hydropower EE **potential between 2 and 5%**

Grid

✓Focus on **recognising investment needs** to increase both efficiency and reliability to:

- ➢enable intelligent coordination of supply and demand
- ➢counteract inefficiencies arising from intermittent renewables and increased variability in demand.
- ➢Introduce smart meters to facilitate energy saving by consumers (but ,more than meters).

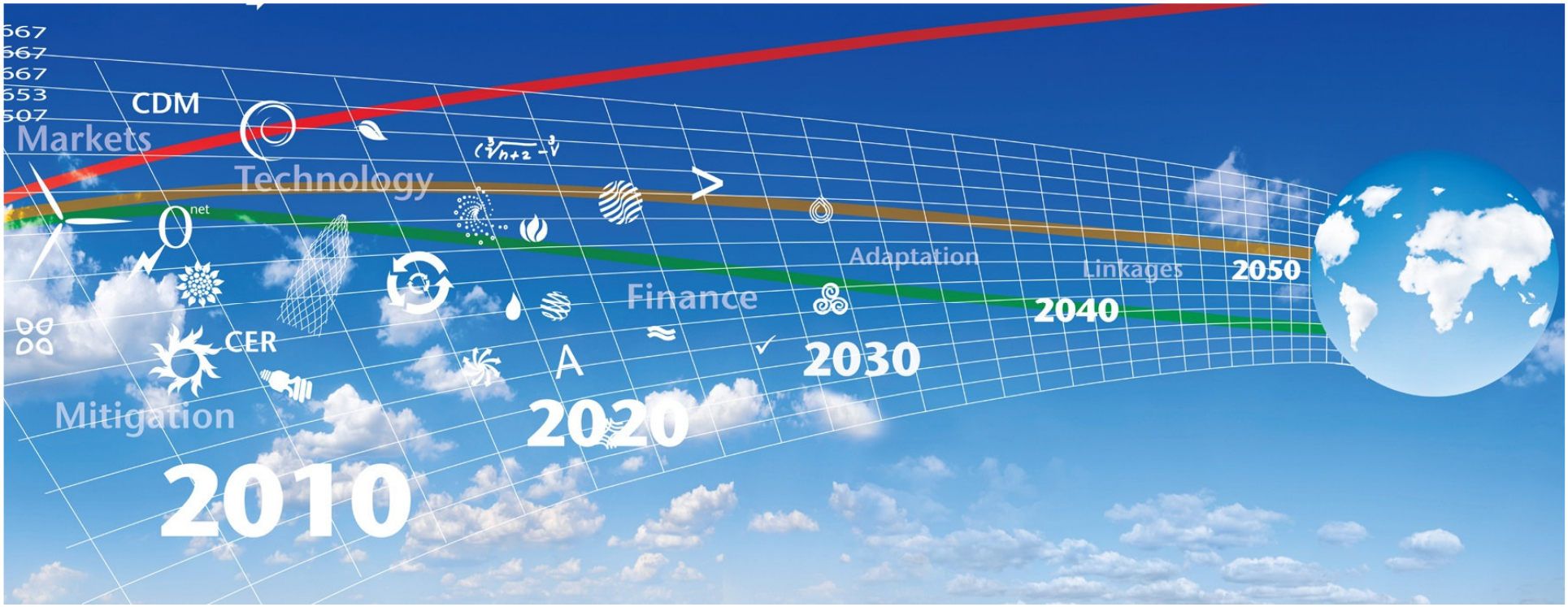
End users

✓**Price signals** (energy and carbon) are key to trigger actions in energy efficiency

✓**New energy-saving business models** should be supported as part of an integrated approach to commercial and residential energy efficiency.

✓In **industrial energy efficiency** programs should encourage sector **benchmarking, build capacity to raise efficiency** towards best in class.

*From our first draft from the Brief on "Energy Efficiency in the power sector supply chain"



Many thanks

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wbcsd electric utilities