



INSTITUTE FOR
CLIMATE
ECONOMICS

Une initiative de la Caisse des Dépôts et
de l'Agence Française de Développement

DECENTRALIZED ELECTRIFICATION AND DEVELOPMENT

UNLOCKING FINANCE FOR DECENTRALISED ENERGY ACCESS: prospects with the Paris Agreement

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I4CE – Institute for Climate Economics

3 research areas addressing the issues faced by actors involved in the energy and climate transition



INDUSTRY, ENERGY AND CLIMATE

Understanding policies
for the low-carbon transition
in the industry
and energy sectors.



TERRITORIES AND CLIMATE

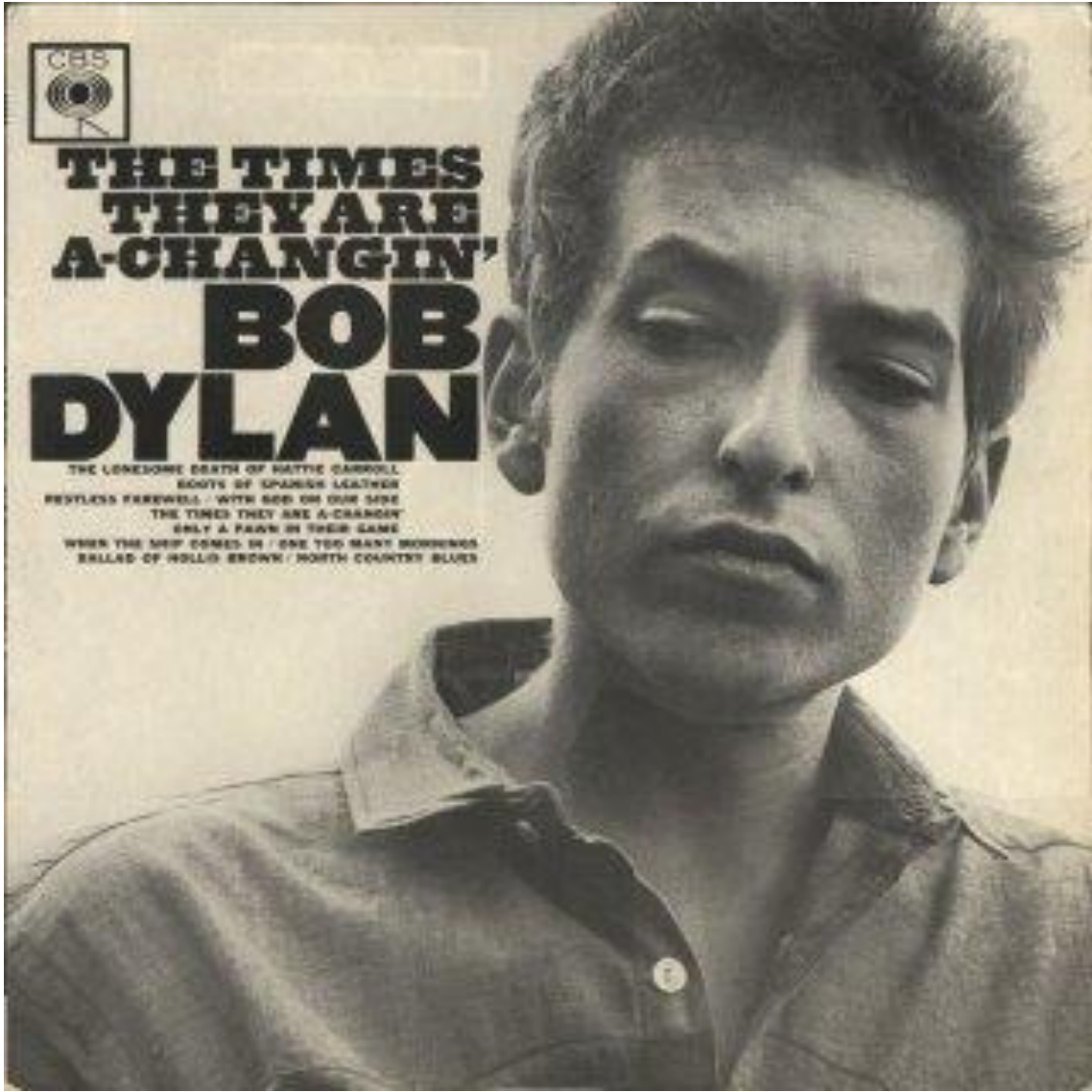
Identifying and analyzing
courses of action in the fight
against climate change in the
agriculture and forestry sectors
as well as urban areas.



FINANCE, INVESTMENT AND CLIMATE

Analyzing the mainstreaming
of climate change into
financial decision-making
by public and private entities.

Bob Dylan was right



A diplomatic success



A revolutionary tryptic



An international agreement in a multilateral framework

- A long-term Agreement
- A COP Decision, immediately applicable



National policies

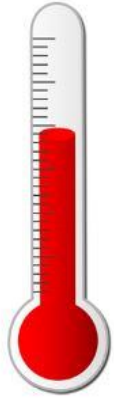
- *Nationally Determined Contributions (NDCs)*



An « Action Agenda »

- Local governments
- Corporates
- NGOs
- etc.

Aligning climate, development and finance



1. **Limit** global warming well below **2°C** while aiming at bringing it to 1.5° with an aim to **reach** global peaking of GHG emissions as soon as possible” and **zero-net emissions** by the second half of this century.

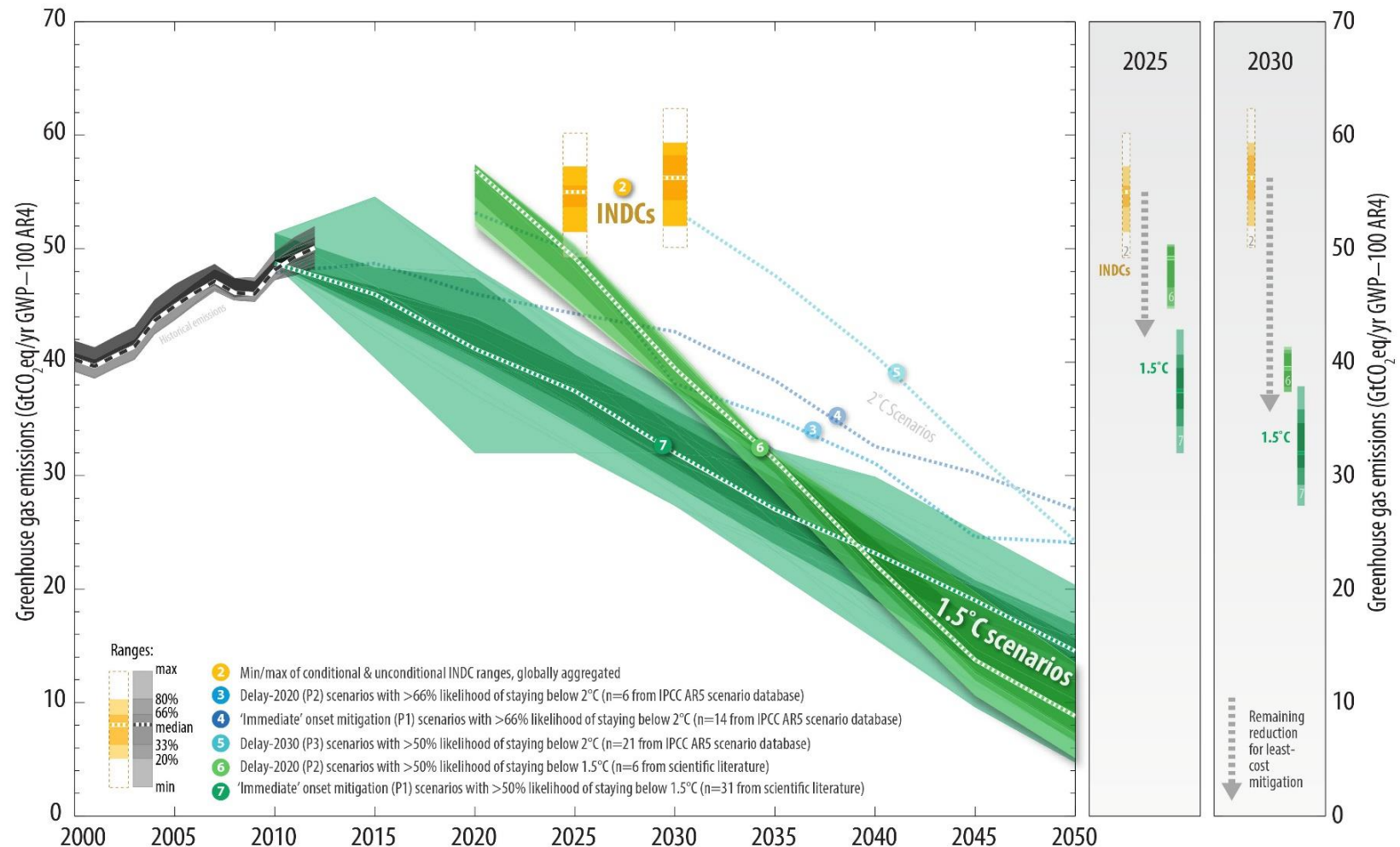


2. **Increasing** the ability to adapt to the adverse impacts of climate change by **promoting** resilience and low-carbon development, in a manner that does not threaten **food production**;



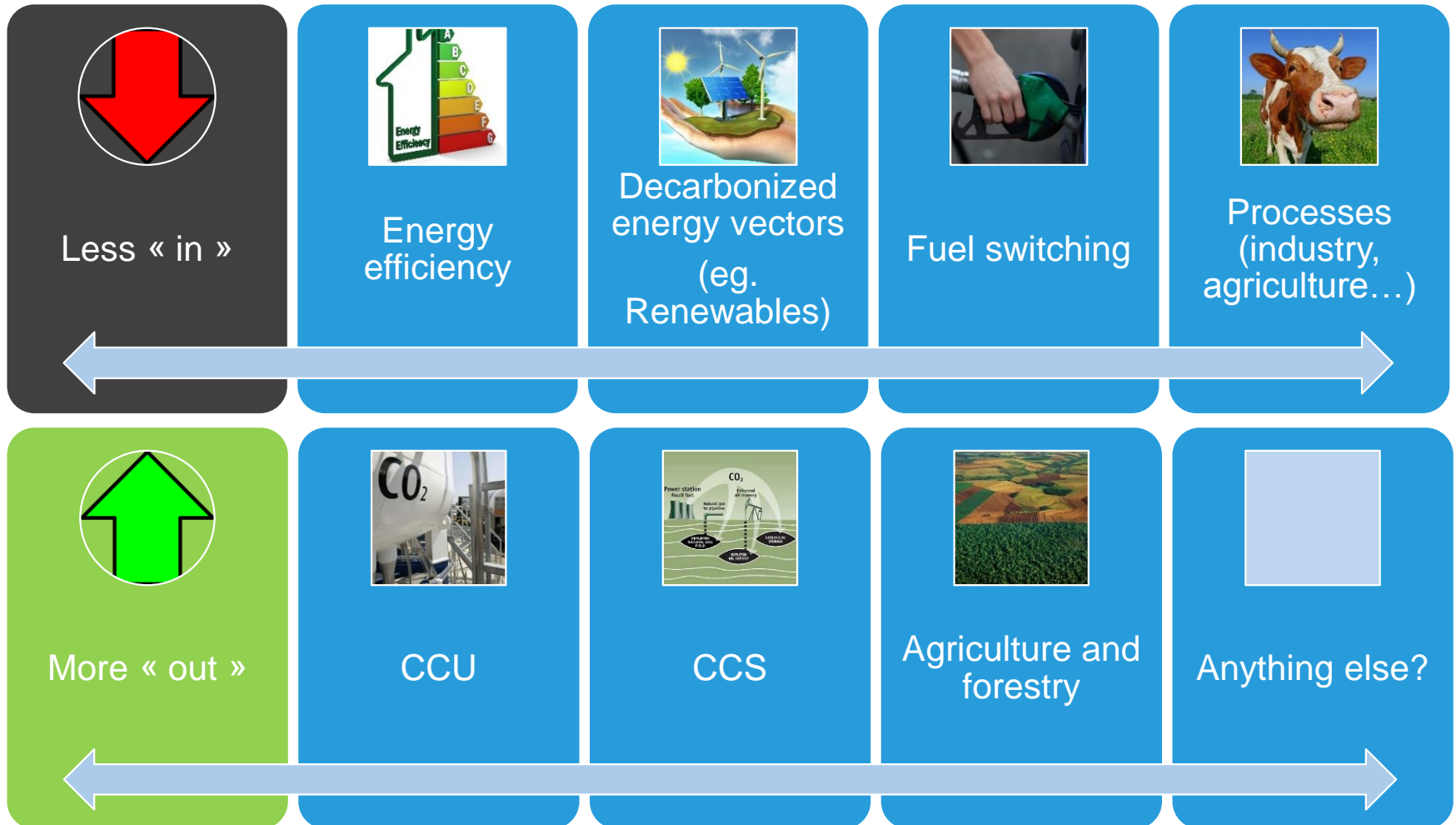
3. **Making** financial flows **“consistent”** with low-carbon climate-resilient development.

Towards a 'zero net emissions' world



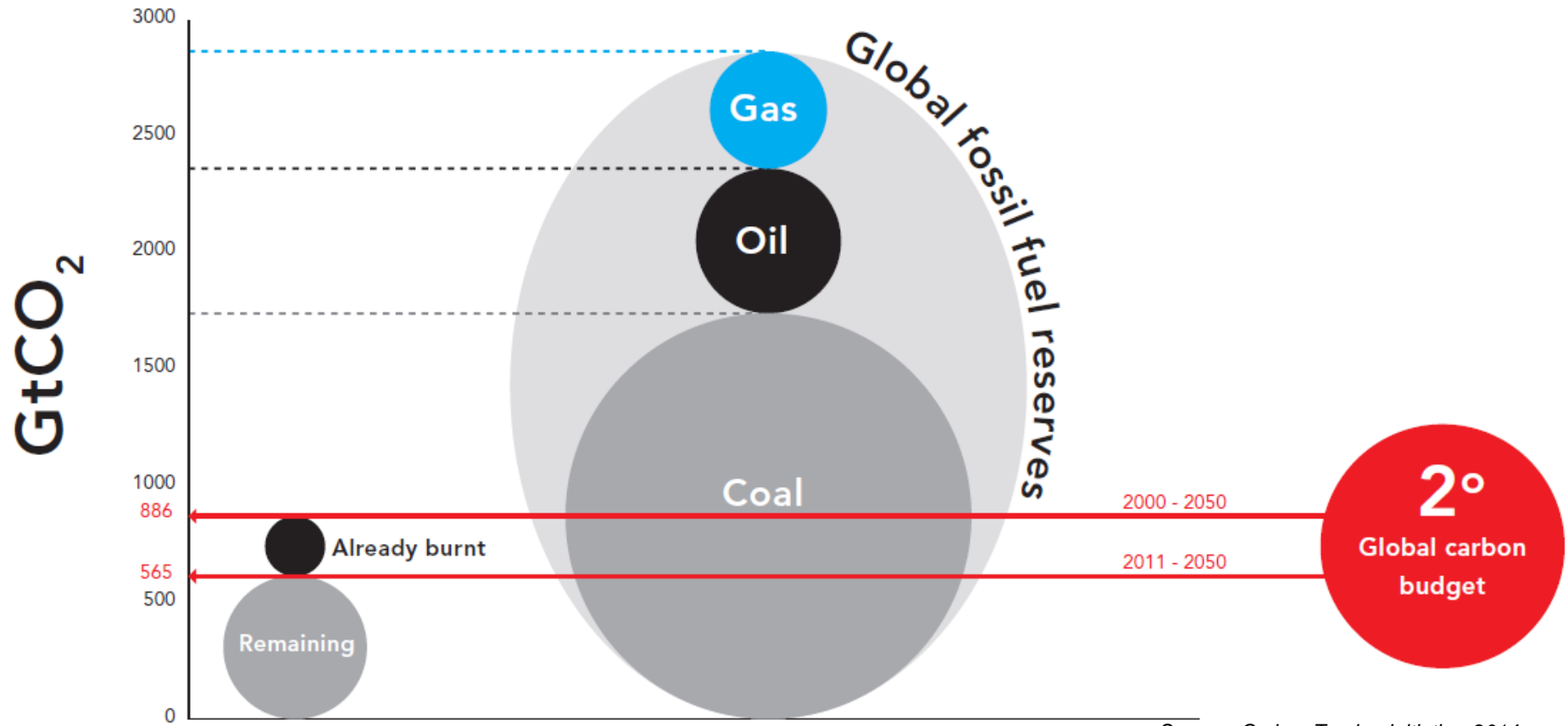
Source: UNFCCC, 2015

How to reach 'zero net emissions' ?



+2°C?

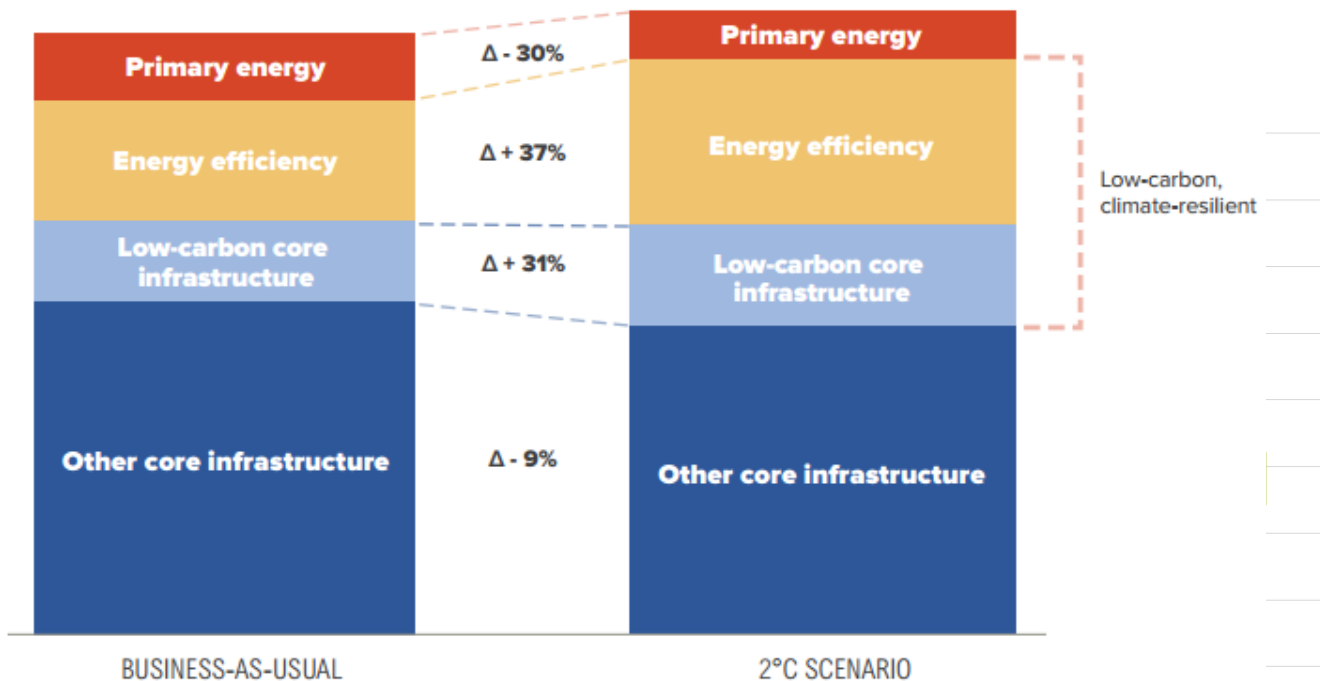
Leaving carbon underground?



Source : Carbon Tracker Initiative, 2014

REDIRECTING 5,000 G\$ per year of public & private investment

Change in infrastructure spending required for a 2°C scenario
(percentage change in expenditure over 2015-2030 compared to Business-as-usual)

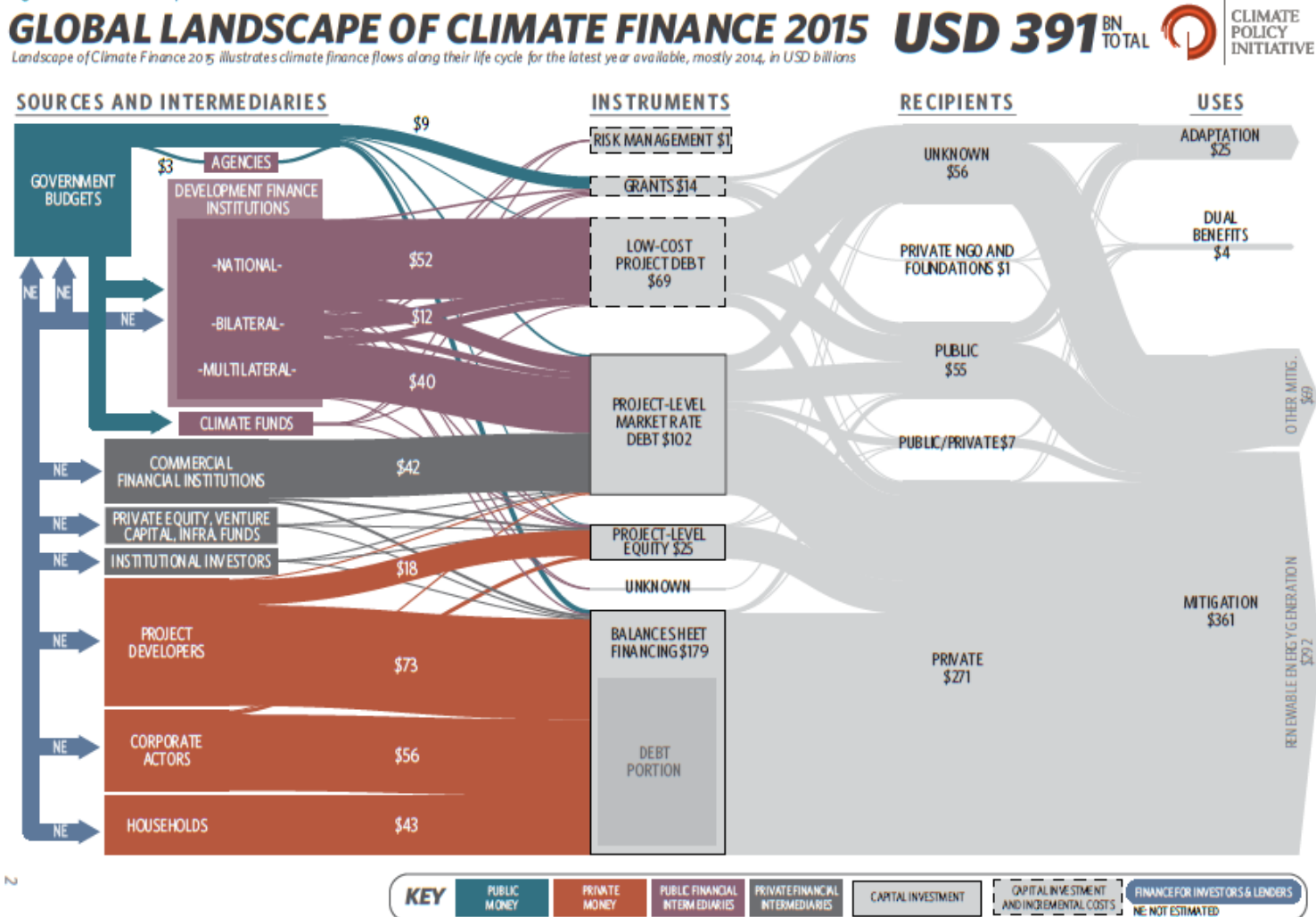


- Primary energy: extraction of oil, gas and coal
- Energy efficiency: buildings, energy and transportation
- Low-carbon core infrastructure: renewable energy, nuclear, CCS, low-carbon transport (e.g. light rail and Bus Rapid Transit systems), climate-proofed water and sanitation including some adaptation infrastructure (e.g. sea walls and flood protection)
- Other core infrastructure: standard water/sanitation, high-carbon transport (e.g. roads), energy production, and telecommunications

Source: *New Climate Economy*, 2016

Above all a question of redirecting...

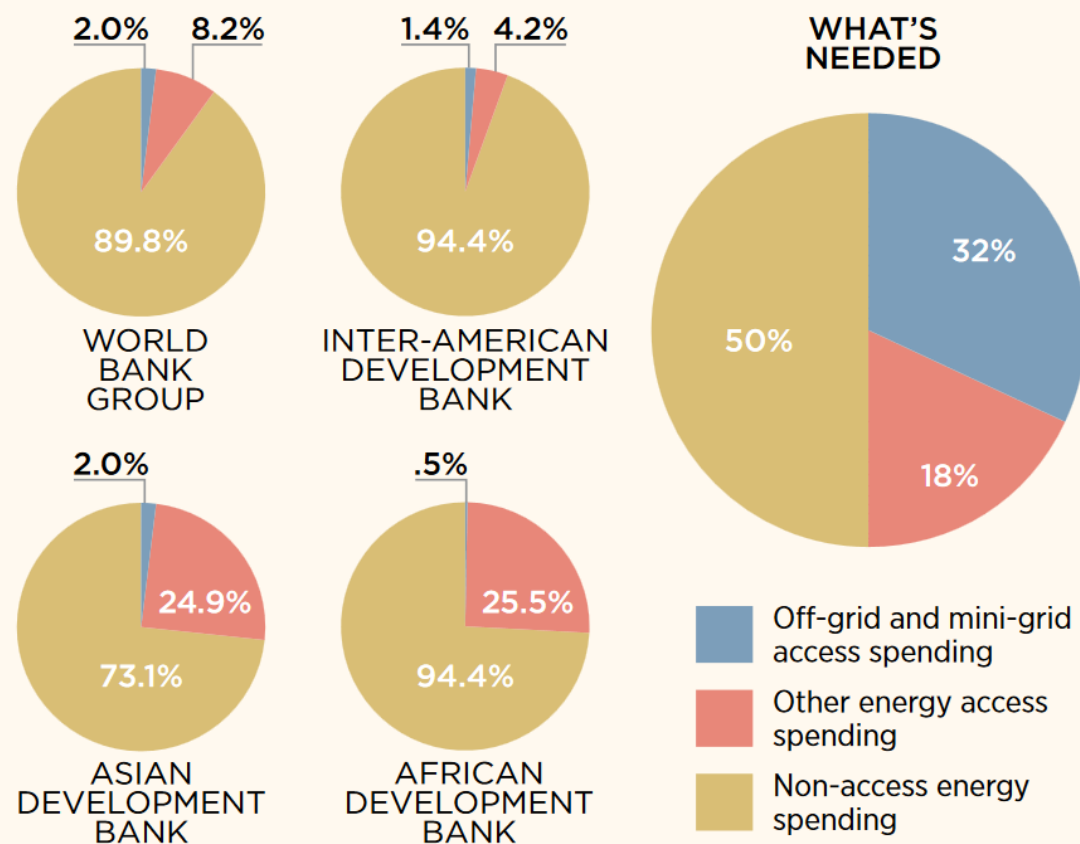
Figure 2. The Global Landscape of Climate Finance 2015



No MDB is aligning its investment on needs for Off-grid and Mini-Grid

- Public funding through Multilateral Development Banks (MDBs) remains well below expected levels for off-grid energy access: **MDBs spent less than 2% of their energy budget on decentralized electrification** between 2013 and 2015 instead of the 32% preconized by the IEA in its “Energy for all” case.

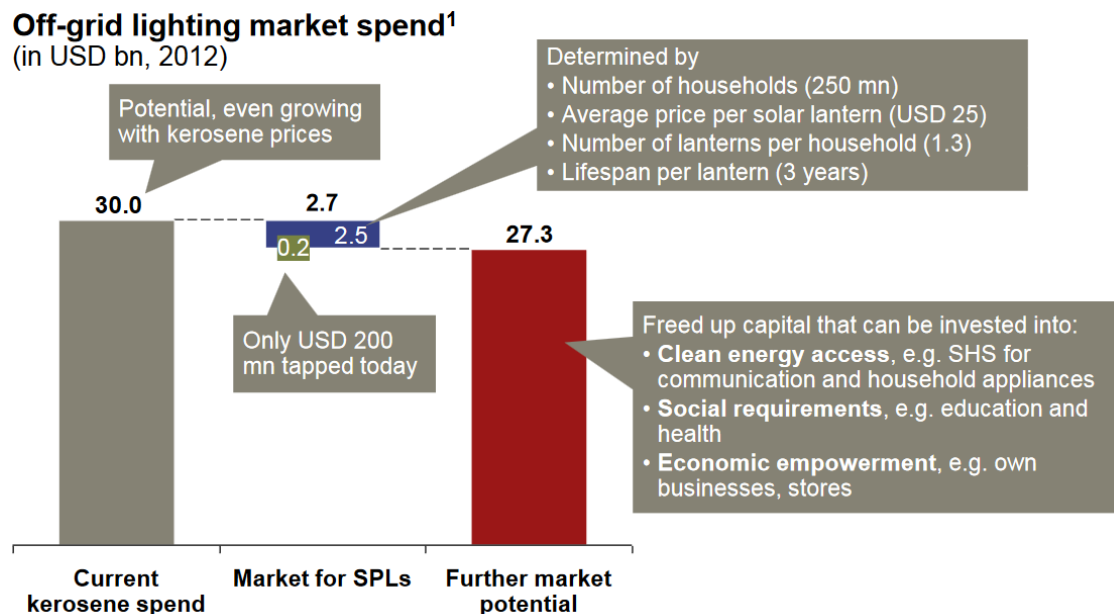
Off-Grid and Mini-Grid Renewable Energy Spending as a Percentage of the Annual Energy Portfolio
(THREE YEAR AVERAGE)



Source: Sierra Club and Oil Change International, 2016

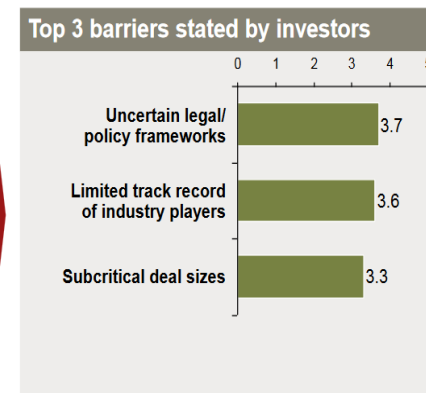
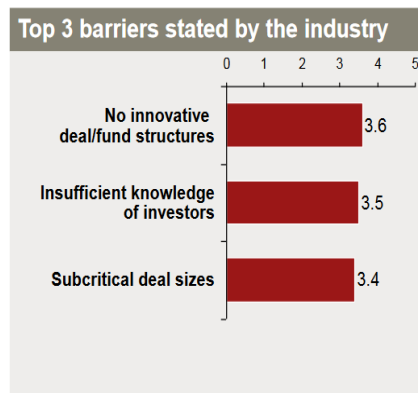
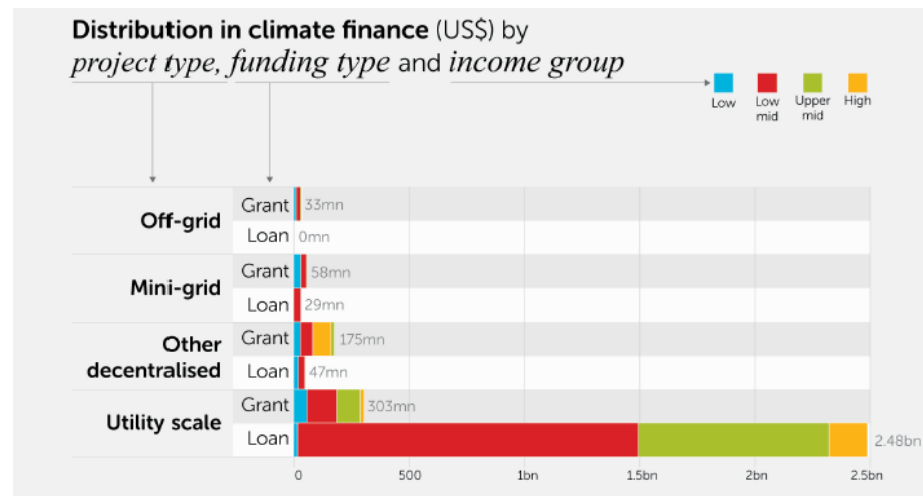
Redirecting financial flows: unlocking opportunities

- **Unlocking finance from black finance:** Off-grid solar lighting only could cut 25bn liters of kerosene burning annually throughout the world and free an additional USD 27bn for other productive and/or mitigation uses.
- **Aligning Climate Finance to needs:** Energy represents 40% of the USD 14bn already granted on behalf of the 100bn pledge, yet decentralized energy makes up only 3.4% of these 14bn.



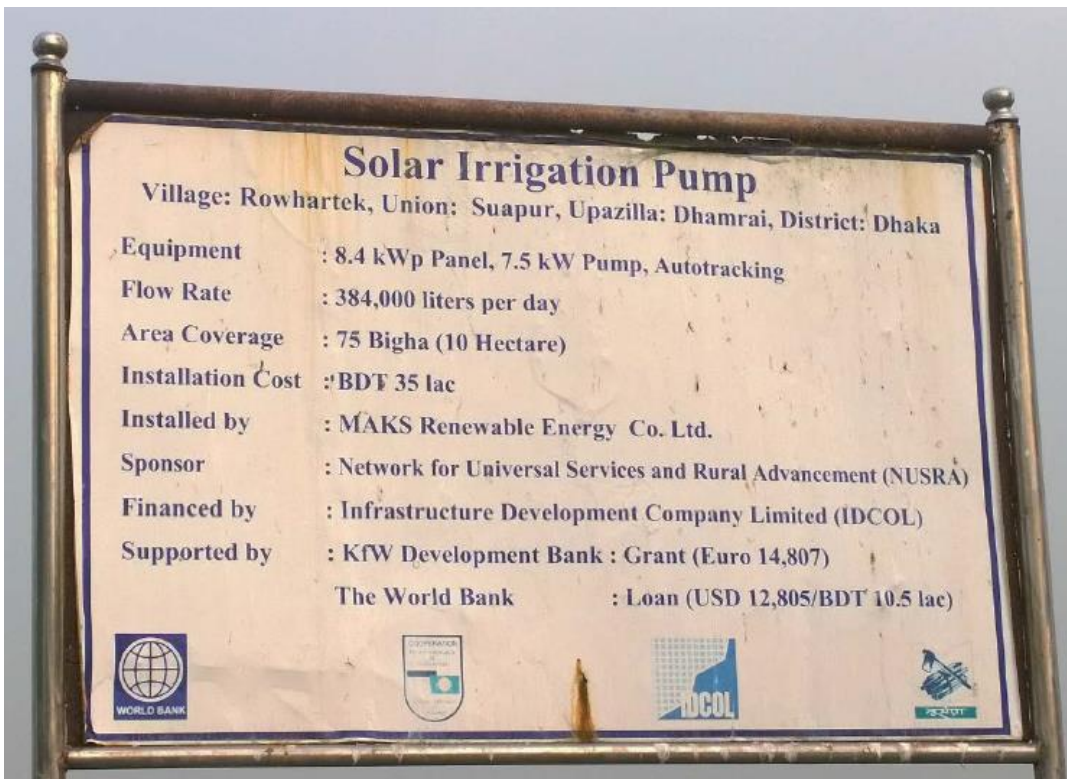
Redirecting financial flows: managing barriers

- **Preference for loans versus grants:** grant-based climate finance is limited and utility-scale projects with established business models are often preferred to off-grid startups for loans.
- **Bias towards large projects:** the main public climate donors) are more experienced with channeling funds towards large projects than numerous small-scale projects.
- **Possibly inadequate fund priorities:** high weight given by climate funds to e.g. mitigation impact and leveraging co-finance => Assessment is costly for low-income countries / organizations...



Source: Rai et al., 2016

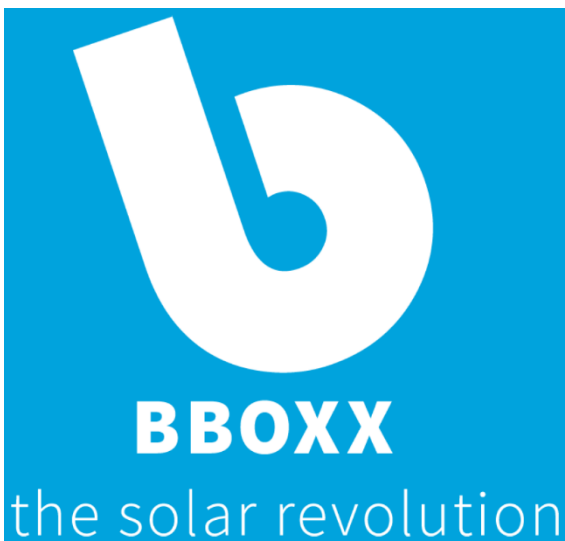
Targetting small-scale projects: 4 million homes in 5 years in Bangladesh



- 150 million citizens
- Nearly 40% off-grid
- Electricity for all by 2021
- RNW target: 10% by 2030
- Set up an *ad hoc* agency:
The *Infrastructure Development Company Limited* (IDCOL)

- IDCOL: A holistic approach supporting a large range of technologies, needs and actors with a wide mixture of financial instruments
- Ability to channel large amounts of finance into lots of small-scale projects
- Supporting the whole off-grid market, not only individual projects

Private finance solutions for off-grid solar deployment: BBOXX



- Solar home systems in Kenya, Rwanda
 - Total 35 countries covered
- Based on monthly payment plans
- **2010:** Official launch
- **2014:** \$5.2M (\$2.5M equity, \$2.7M credit lines)
- **2015:** \$15M (\$9.8M equity, \$5.3M debt)
- **2016:** \$20M investment, 350.000 customers
- **2020:** “We hope to provide energy to +20 million people”

- 2015: \$500,000 Distributed Energy Asset Receivables (DEARs) using securitization as a means of financing solar home systems in Africa, allowing to realize income up to three years earlier.
- Aim: \$2bn in the next five years
- “We are already deploying systems at the fastest rate in East Africa, at 10kWp of solar per day...”

Take away messages

- The bulk of the financing flows towards « zero net » will be domestic and private
- Funding Off-grid energy access: a question of redirecting financial flows ...
- But also some obstacles to overcome: economic and financial risks and transaction costs
- Climate benefits and co-benefits need to be better promoted.
- Finance won't do it all, but nothing will be achieved without finance
- A quiet revolution: Bob Dylan was right

“A vos questions !”

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