



Real World Experiences of Technology Transfer

*WIPO Conference on Innovation
and Climate Change*

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Or How to create *readiness* for climate investment

Mobilizing
Climate Investment



IPCC *Special Report on Technology Transfer* - definitions

- “Technology Transfer” is a broad set of processes covering the flows of know-how, experience and equipment
- Tech transfer encompasses ***diffusion of technologies and technology cooperation across and within countries***
- Tech transfer comprises the processes of learning to understand, utilize and replicate a technology, including the ***capacity to choose it and adapt it to local conditions*** and to integrate it with indigenous technologies



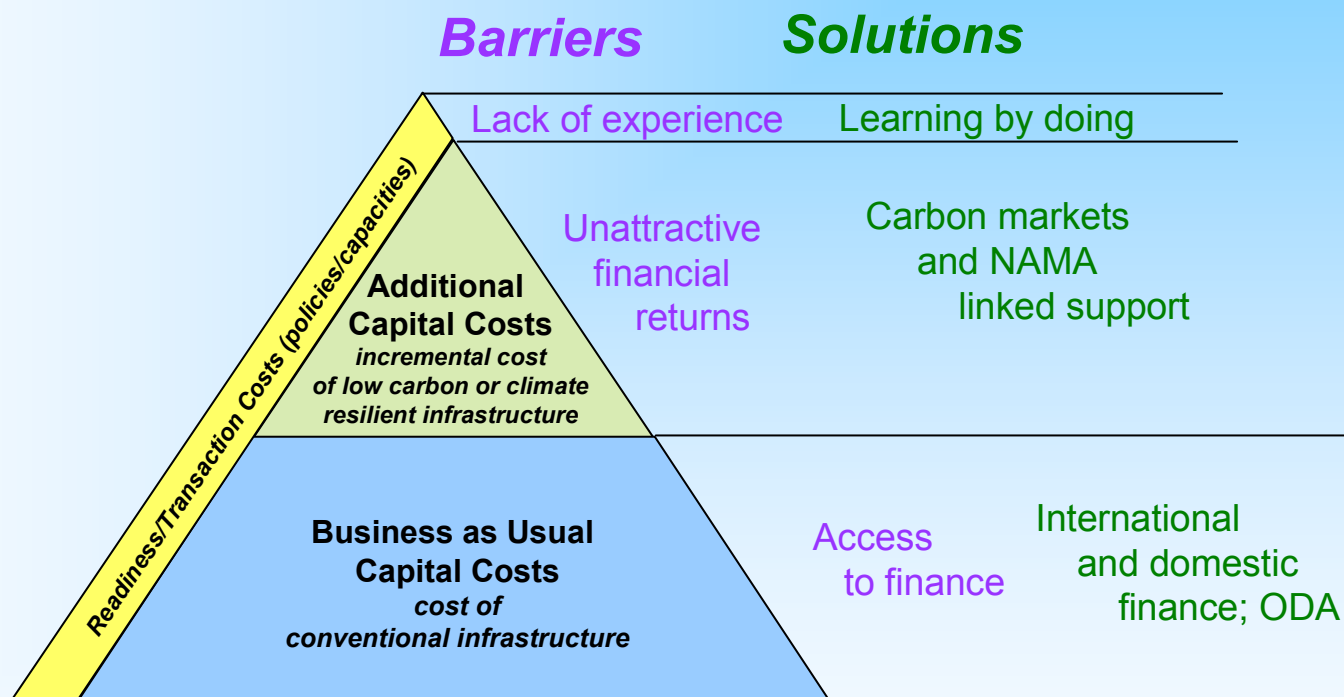
SRTT conclusions

Successful, sustainable technology transfer requires a multi-faceted enabling environment, including:

- macroeconomic conditions
- the involvement of social organizations
- national institutions for technology innovation
- human and institutional capacities for selecting and managing technologies
- national legal institutions that reduce risk and protect intellectual property rights
- good codes and standards
- collaborative research and technology development
- the means for addressing equity issues and respecting existing property rights.

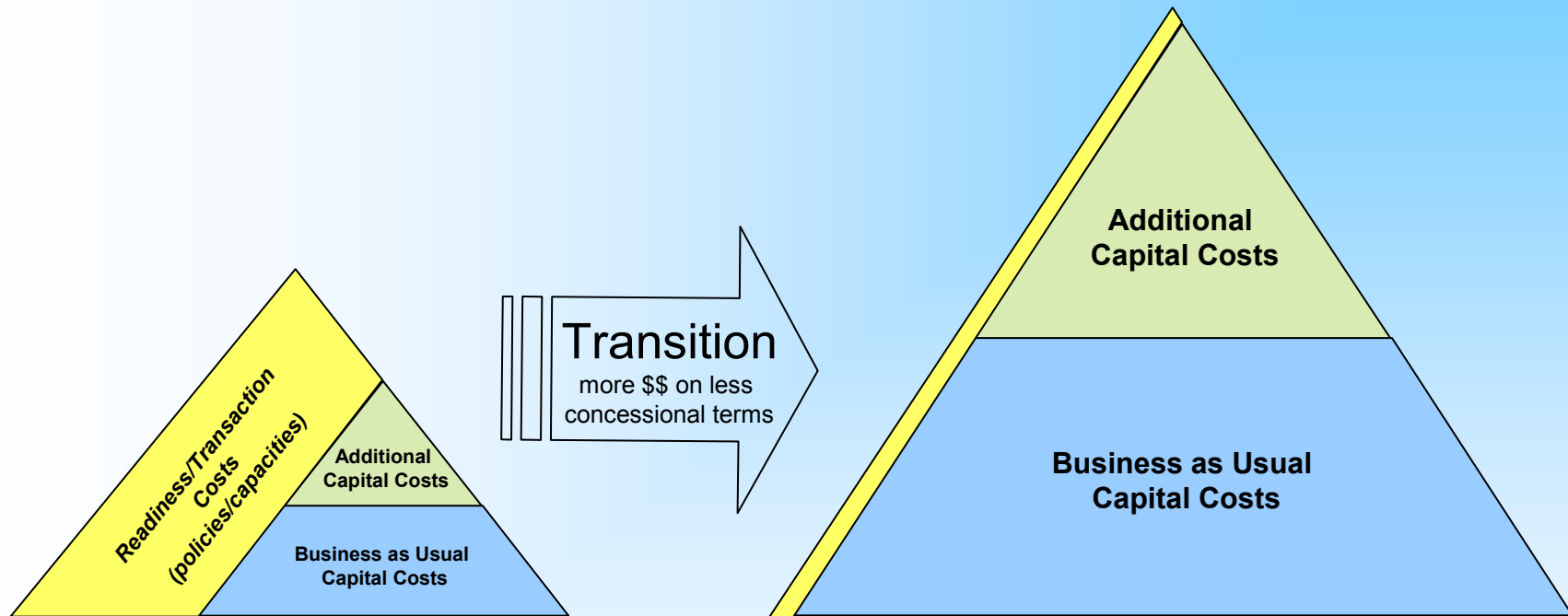


Going back to first principles: *What are technology/finance needs actually?*



Many technology and finance discussions blur the lines between different types of costs and barriers. This creates confusion.

Phasing any support is important



Creating Readiness

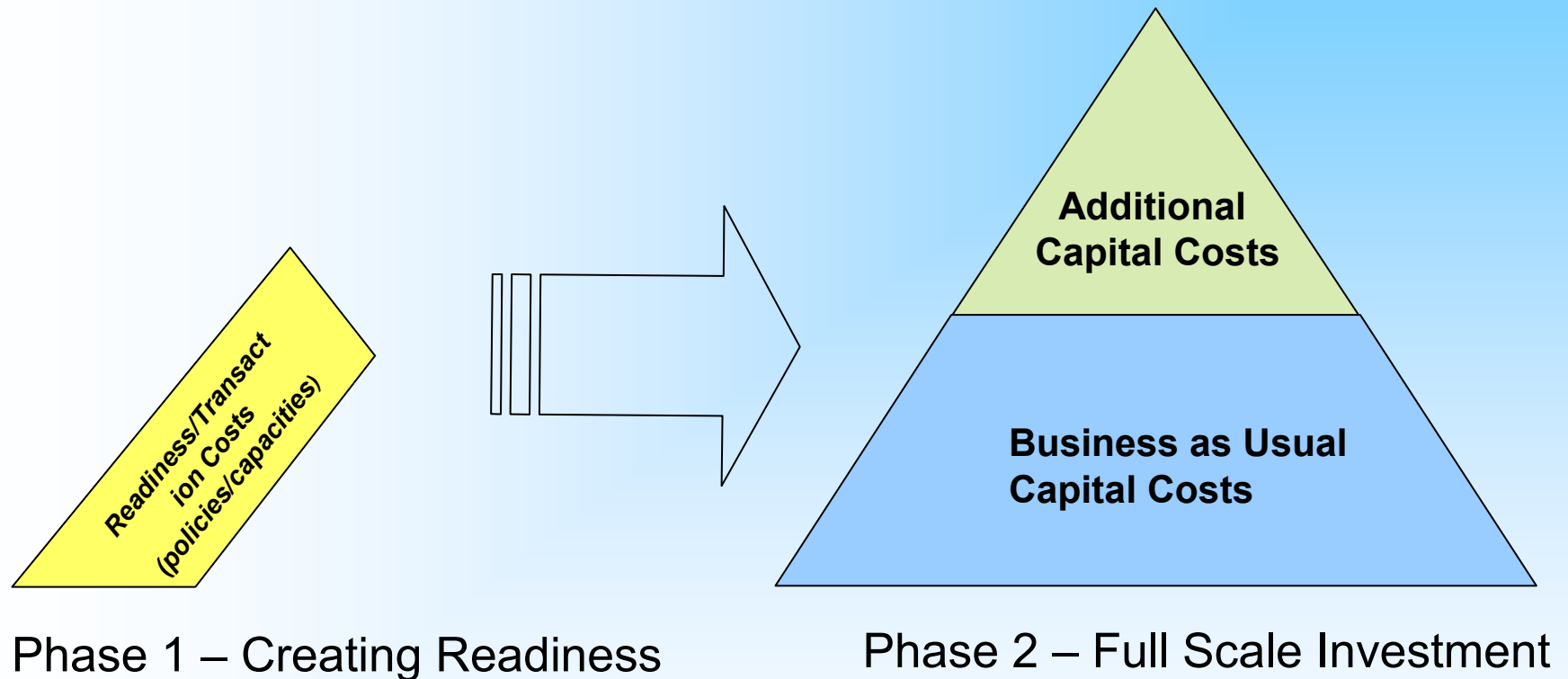
- building capacities / lowering transaction costs
- financing innovation, and
- mobilizing early investments

Scaling-up Investment

- maintaining human/institutional capacities
- paying for additional costs through carbon/NAMAs/NAPAs and
- ensuring access to finance

Take a phased approach, with different type of support during each phase.

The wrong approach



Don't separate capacity building for technology transfer from efforts to mobilize investment.



What is Readiness / Pre-Investment?

- **Policy Support:** analysis of policy options, developing policy roadmaps, reviewing and undertaking legislative and policy reform
- **Pre-Investment Support:** country investment strategies, assessment of renewable energy resources potential, technology needs assessments, analysis of investment options for low-carbon development
- **Creating bankable projects** by buying down initial costs and reducing transaction costs
- **Early actions** to test out options for promoting climate resilience, low carbon growth and achieving other 'quick wins' in mitigation and adaptation.

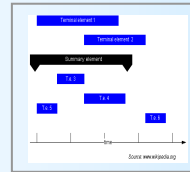
What are some good examples of national programmes fostering innovation, technology transfer, and 'readiness'?

CORFO

(Chile) renewable energy tech transfer program

Preinvestme

Investment



**Pre-
Investment
Studies**

**Project
launch
assistance**

**On-the-job
training for
Human
Resources**

**Equipment &
Infrastruture**

**Long term
Property
leasing**

**Specialized
Training &
Recruitment**

Up to 60% of the pre-investment study cost.
Maximum=
US\$30,000

Up to **US\$30,000** for start-up activities

Up to 50% of annual salaries.
Maximum= US\$25,000 per employee hired

Up to 40% of investment on equipments and infrastructure.
Maximum= US\$ 2.000.000

Up to 40% of long-term property leasing costs (5years).
Maximum=US \$ 500.000

Up to 50% of the specialized training or recruitment.
Maximum=US \$ 100.000

Carbon Trust Innovations and Enterprises highlights over this past year

Research & Development

§ Developing innovative new low carbon **technologies** with clear potential route to market



- § **166** Applied Research projects over 6 years
- § Strong track record of follow-on funding and patents raised
- § Directed research projects to drive commercially focused research in key areas

Business Incubation

§ Supporting development of low carbon **companies** and helping them attract private investment



- § **70** incubator companies
- § Over **£70m** of private sector funding raised to date
- § **3** have achieved AIM listings

Technology Acceleration

§ Working with industry to accelerate low carbon technology **markets** by addressing major barriers



- § **8** major accelerator projects
- § Focus on large scale field demonstrations
- § Track record of influencing industry development & policy
- § Over **£35m** committed to date

Carbon Trust Enterprises

§ Developing new low carbon businesses and providing access to new opportunities for UK investors.



- § **Partnership for Renewables (PFR)**
- § On-shore wind farms on public land
- § HSBC investment of up to **£100m**



What is UNEP doing to promote
technology transfer and increased
climate investment ?

One example



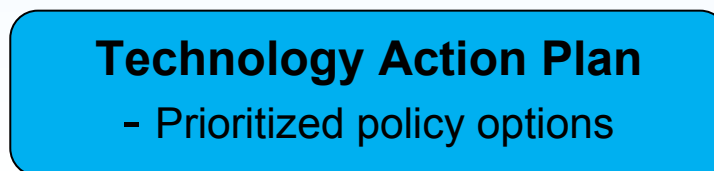
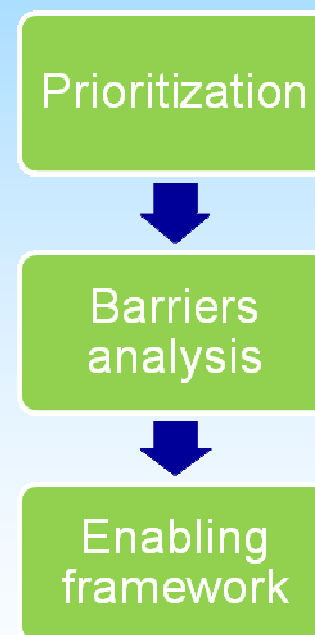
GEF-funded Technology Needs Assessments project

Moving from Needs Assessments to Action Plans

Mitigation technologies

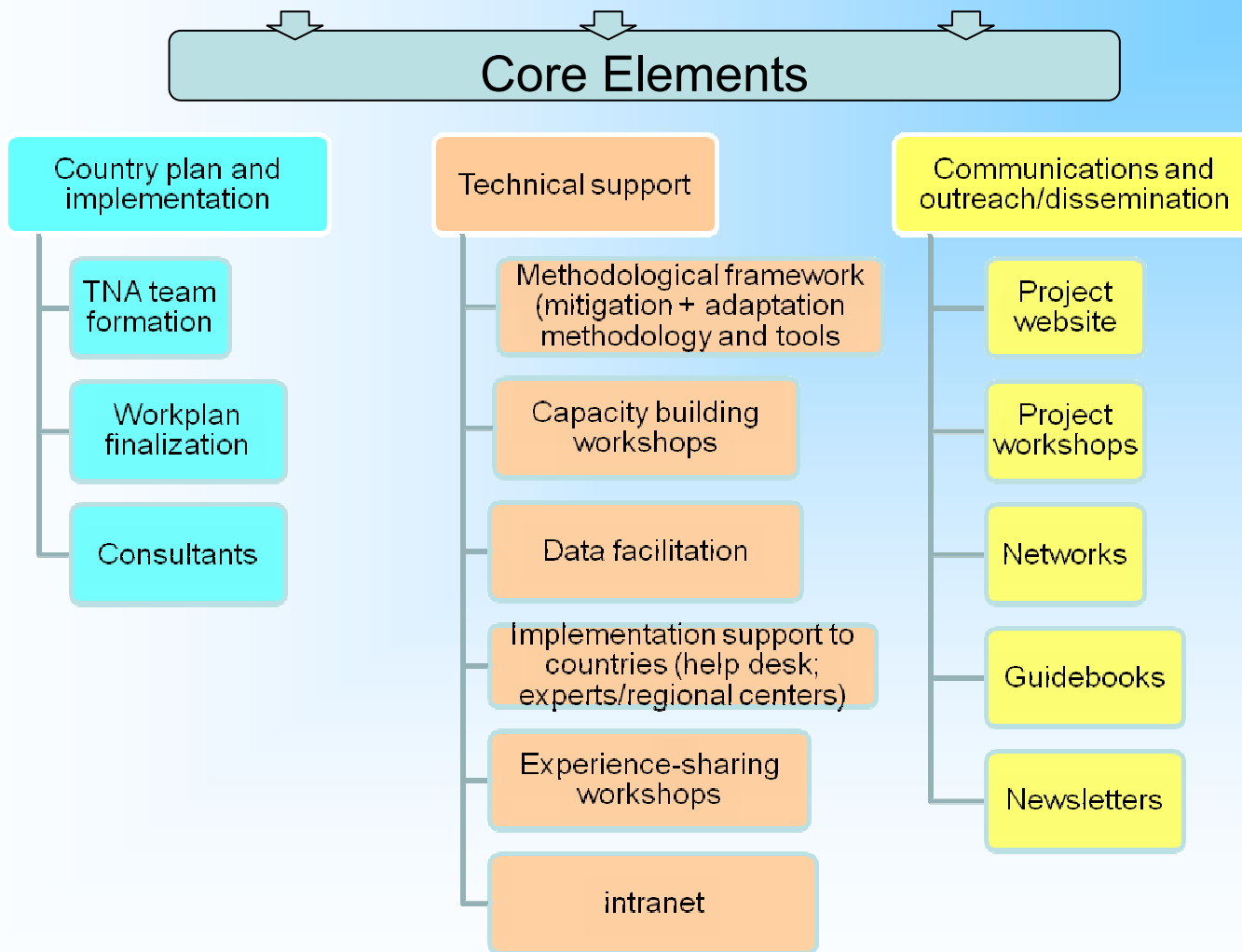


Adaptation technologies

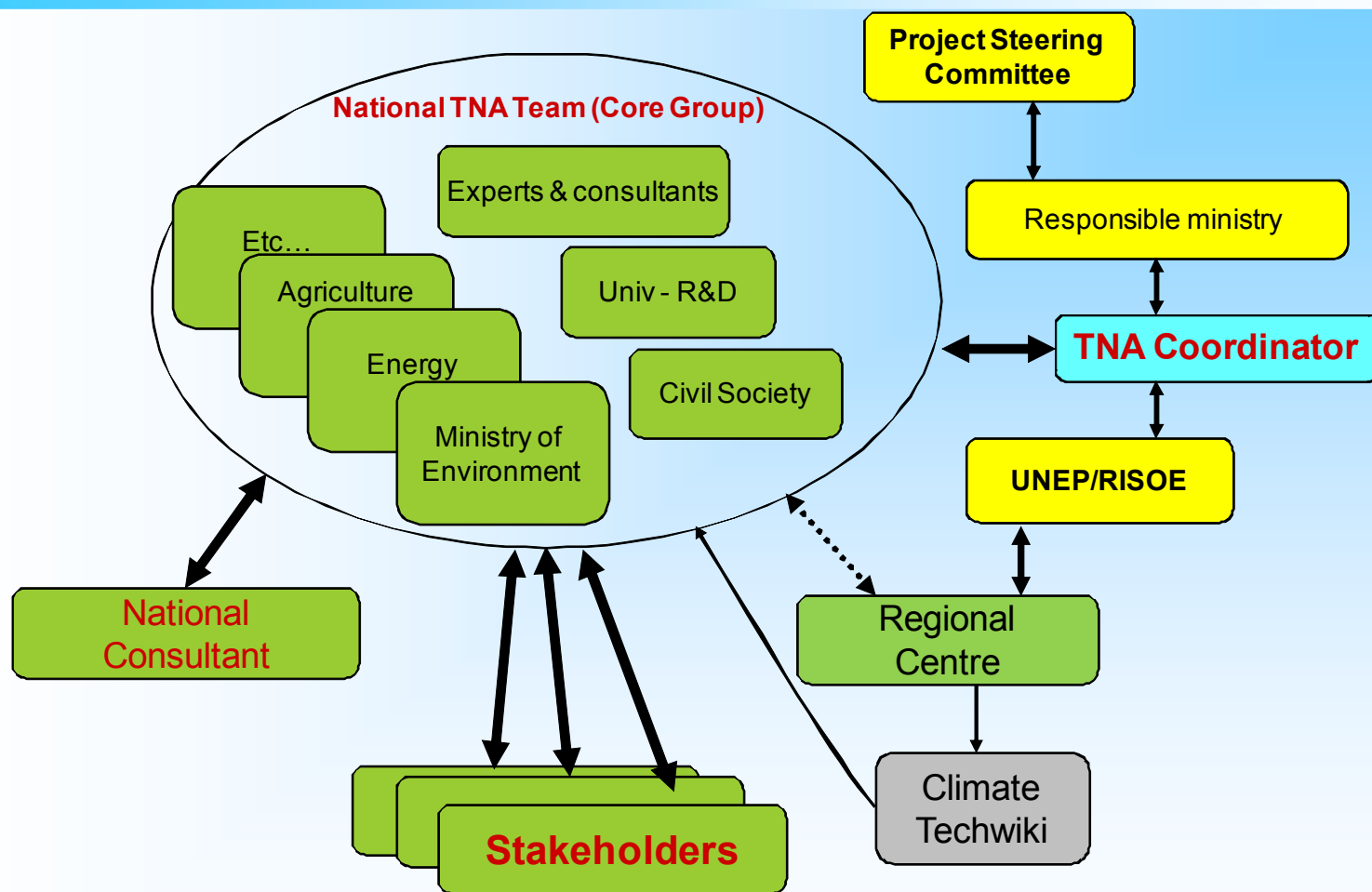




TNA approach



TNA - national organizational structure





Some concluding thoughts

There are no single or simple solutions:

- Action needs to combine different policies and approaches. Solutions that address climate change, expanded access, and energy security at the same time are best from an energy perspective
- Long-term and predictable policy support is crucial to develop and sustain markets and industries
- Market forces should be used where appropriate, but solutions are individual and no single solution exists
- There is lots of political, economic and institutional resistance to overcome. Heightened awareness based on solid information and credible data regarding technologies, policies, and costs is critical.





Menu of useful services

Mitigation and Technology

- Building capabilities in developing countries to prepare low emission development plans, and supporting MRV
- Supporting regional technology centres and creating / nurturing climate change networks
- Strengthening developing country capabilities for preparation and implementation of low carbon projects (CDM, for example)
- Support in developing national technology roadmaps and conducting regional technology market assessments
- Supporting local bank lending for clean technologies, both large and small

Readiness and transaction costs

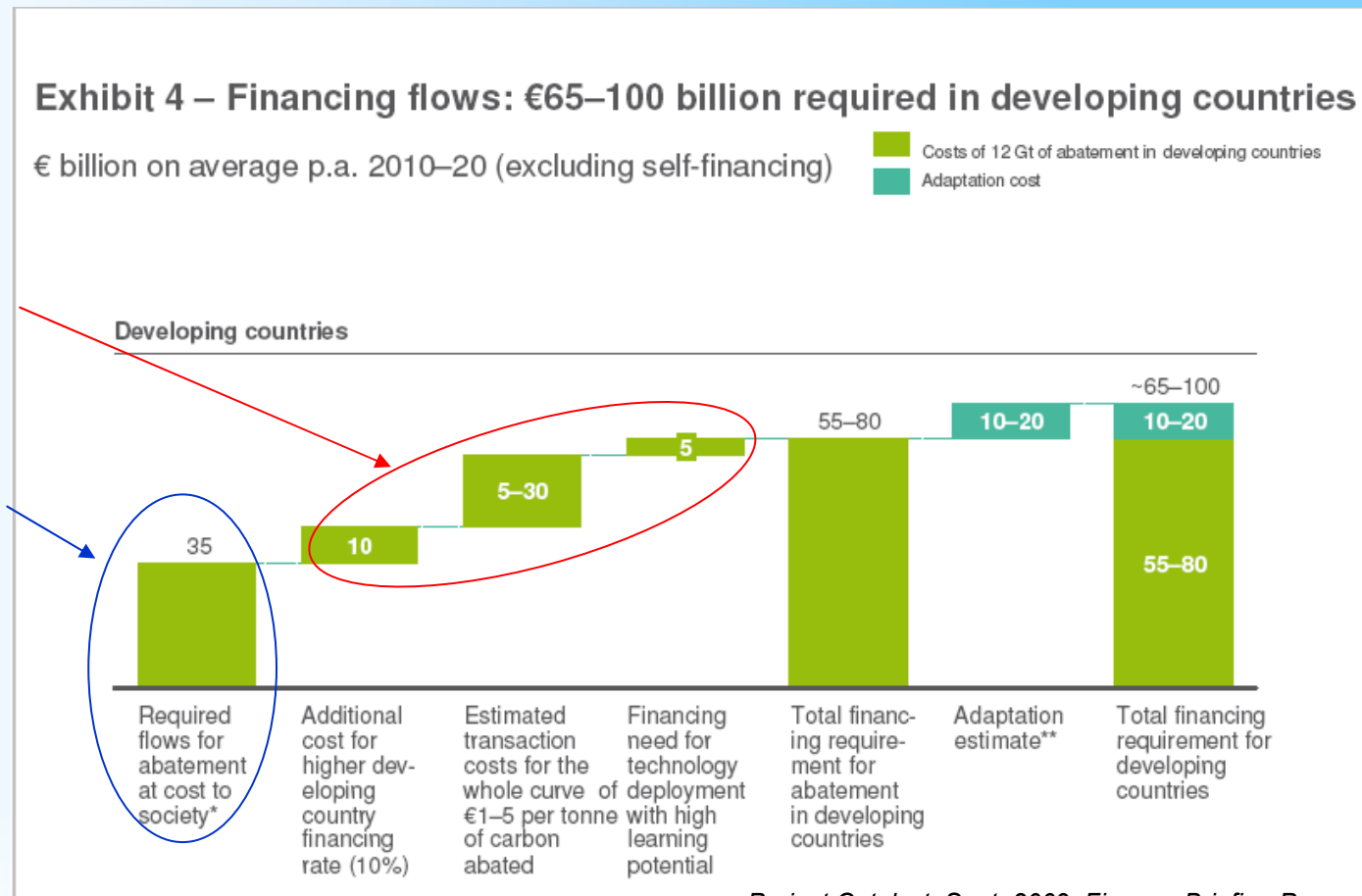
Exhibit 4 – Financing flows: €65–100 billion required in developing countries

€ billion on average p.a. 2010–20 (excluding self-financing)

■ Costs of 12 Gt of abatement in developing countries
■ Adaptation cost

When they should also be here

Most eyes are here



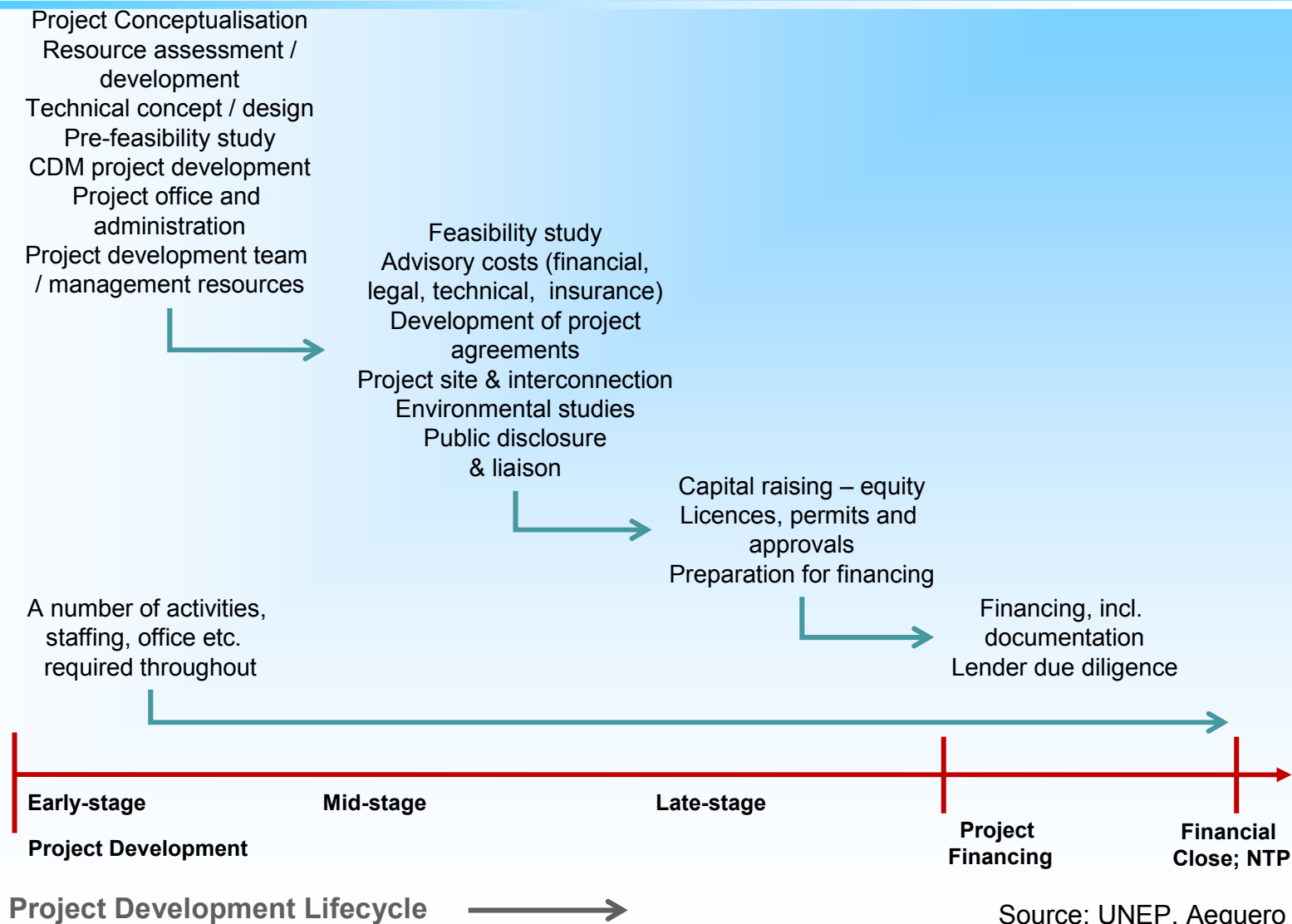
Project Catalyst: Sept. 2009, Finance Briefing Paper

Creating demand for financing requires that transaction costs be better understood, and ways for dealing with them better defined.



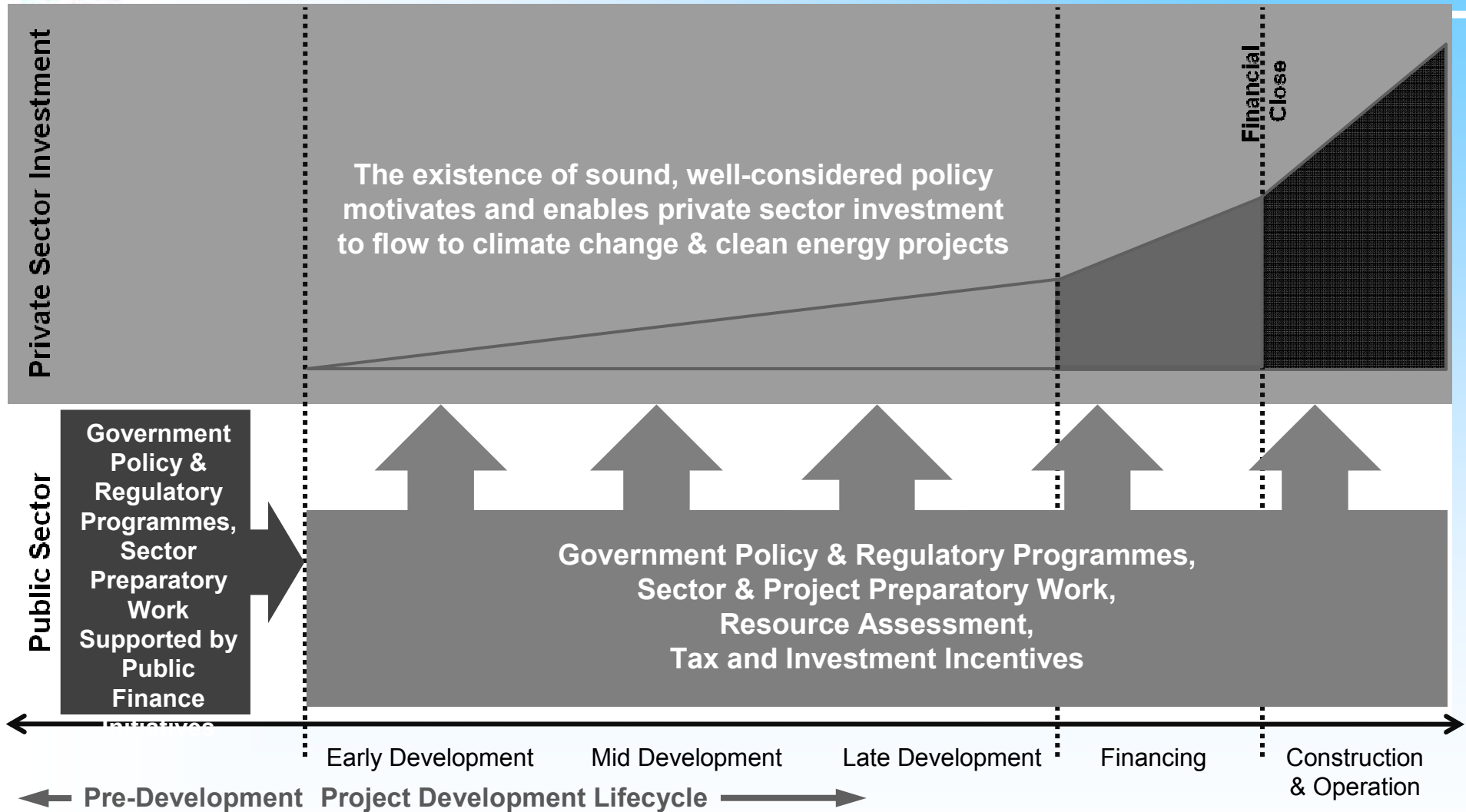
Example transaction costs

Developing renewable energy projects





Underpinning investment with sound policy



Strengthened enabling environments offer the best value for money.

Source: UNEP, AEQUERO



Designing a CTCN - Taking stock is not easy

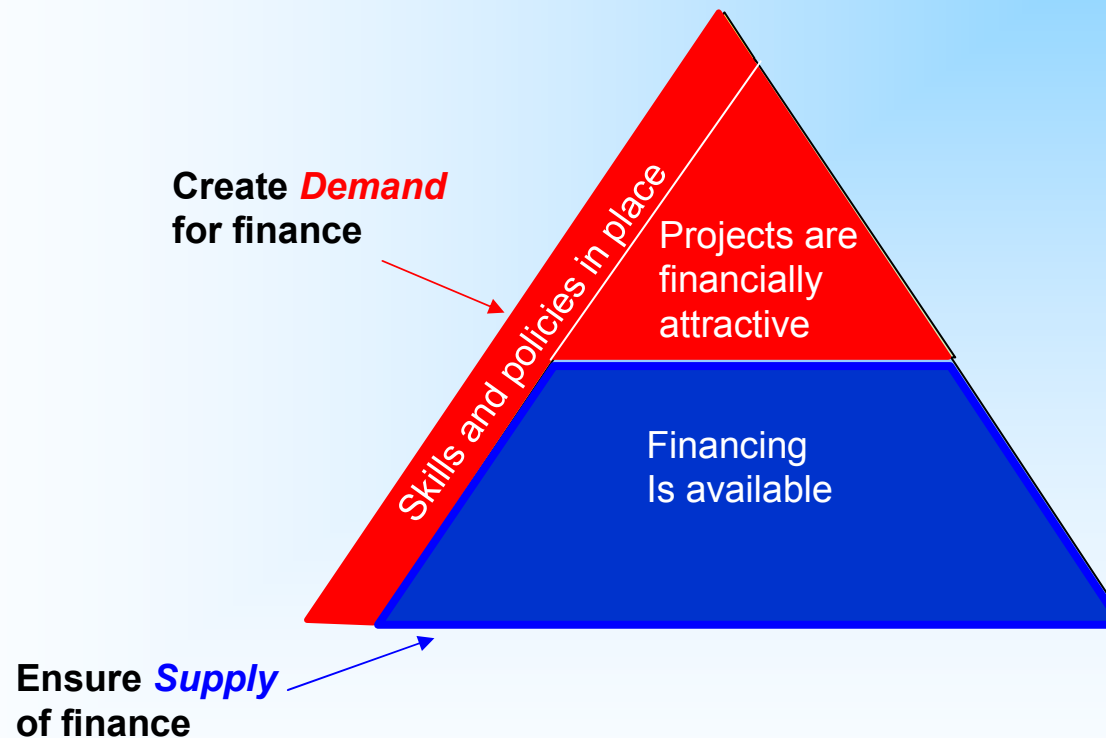
- There is no agreed definition for a technology collaboration activity, so mapping existing efforts is hard
- Many initiatives exist, but these differ greatly by objective, type of partner, size, activities undertaken, degree of political connectedness, geographic scope, and so on
- Examples include:
 - Public-private policy dialogue and cooperation
 - Government regulatory cooperation and policy learning
 - Database-centered information and knowledge exchange
 - Collaborative technology innovation efforts
 - Technology specific initiatives (clean coal, efficient lighting, etc.)
 - Skills and capacity building
 - Funding and project implementation
 - Public engagement and education



There are challenges with existing approaches

- 1) The proliferation of initiatives can make it hard to find opportunities for good collaboration
- 2) Policy initiatives don't often move beyond dialogue to achieving real policy change in practice
- 3) There is limited private sector engagement for the most part
- 4) A focus on immediate needs means little long-term strategy, ill defined objectives, and lack of measurable outcomes
- 5) There are challenges in deploying funding quickly and strategically
- 6) There exists a general failure to achieve 'scale' due to resource and capacity constraints

Rebalancing supply and demand



Most emphasis to date has been on ensuring a supply of finance. There is a need to also foster the demand for this finance.



A look at the record suggests features that lead to success

Attributes of successful centres and networks:

- Shared interests among partners
- Stable, long-term funding and strong political support
- Clearly defined missions and metrics for measuring success
- Open and efficient information sharing
- Participation of both the public and private sectors
- Flexibility to respond to evolving conditions and opportunities
- Integrated approaches to R&D, demonstration and deployment
- Appropriately sized networks for effective cooperation (too big or too small makes for problems)
- Provision for capacity building support of members where needed



Potential delivery mechanisms

Services of centres and networks in the COP-15 technology decision could take on any number of different forms:

Potential Centre and Network Services and Delivery Mechanisms

- Dissemination of tools, knowledge, and best practices
- Technology forums
- Expert assistance teams (virtual or physical)
- Support for strategic planning (e.g., LEDS)
- Training and workforce development
- Matchmaking / investment facilitation
- Support for technology innovation
- Support for implementation of specific RD&D programmes



Some suggestions

Focus on strategic planning and helping countries develop a strategic approach and sound policy infrastructure:

- Description of development goals, climate vulnerability, and GHG inventory
- Long-term vision for low-emission, climate resilient economy
- Identification of mitigation potential and costs and adaptation options; plans for key sectors
- Policy levers that “need to be pulled”
- Plans for infrastructure investments that distinguish between what a country can do on its own and where international assistance matters
- Macroeconomic modeling
- Finance is critical, but not sufficient
- Climate funds can improve impact through a “readiness” component and by addressing transaction costs; the CTCN can help here



Southeast Asia Climate Change Network (SEAN-CC)



Working primarily through the National Climate Change Focal Points and mobilizing other actors, the Southeast Asia Climate Change Network (SEAN-CC) – funded by the Government of Finland - aims to guide ASEAN countries making sound policy, technology, and investment choices that lead to a reduction in greenhouse gas emissions and better approaches to adaptation.



How does SEAN-CC operate?

SEAN-CC provides support to 10 governments in Southeast Asia to inform and support climate change focal points and other stakeholders to reform policies and implement programmes for renewable energy, energy efficiency and reduced greenhouse gas emissions, and climate change adaptation

1



Knowledge generation and sharing
through meetings, seminars and conferences and online knowledge sharing platform

2



Targeted capacity building
through tailored training programmes and workshops

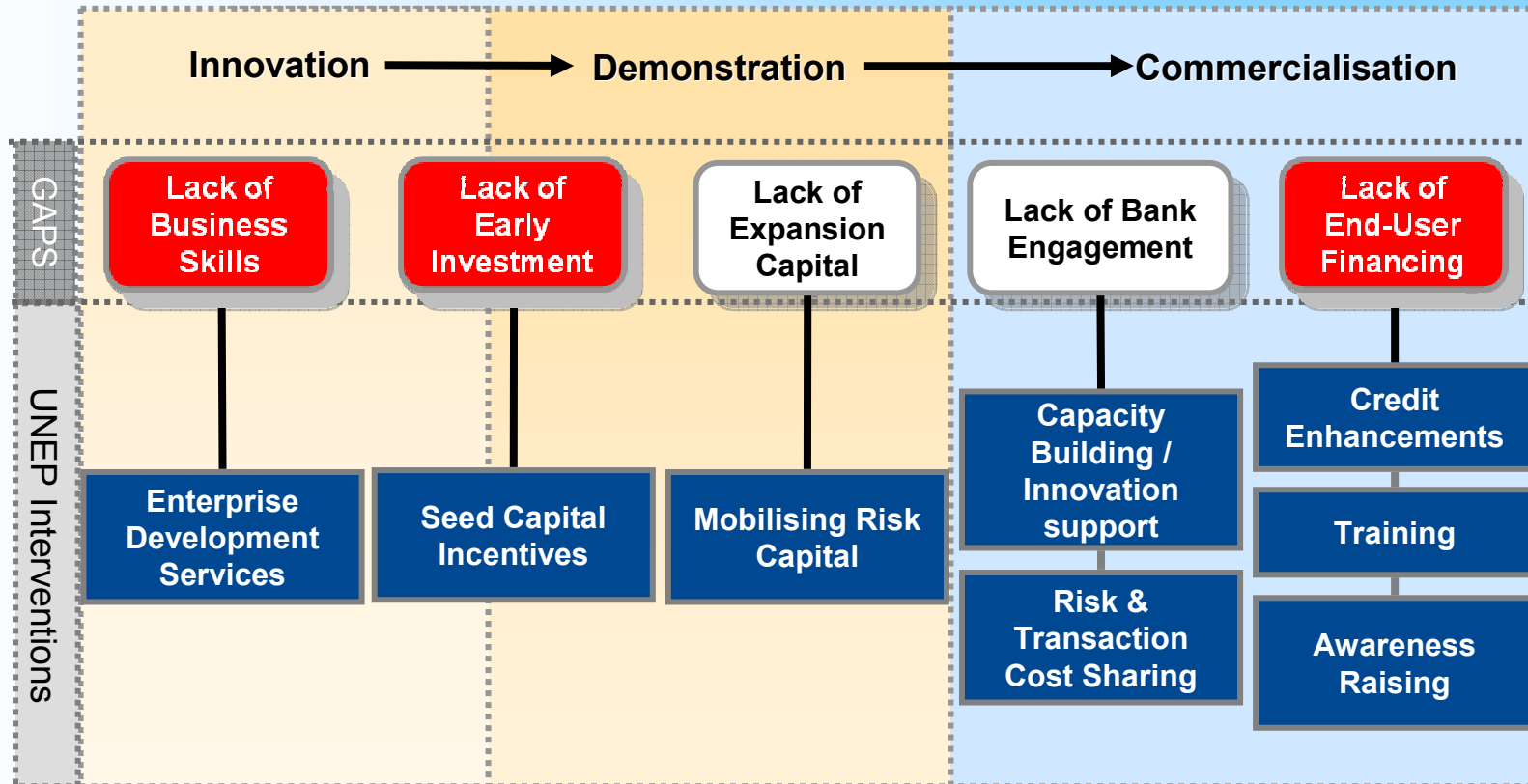
3



Sector specific technical assistance and policy advice
for national and regional climate change mitigation actions



UNEP ways of mobilizing climate investment





Seed
Capital
Assistance



ABOUT



Enterprise Dev.
Cost Sharing

Seed Capital
Incentive

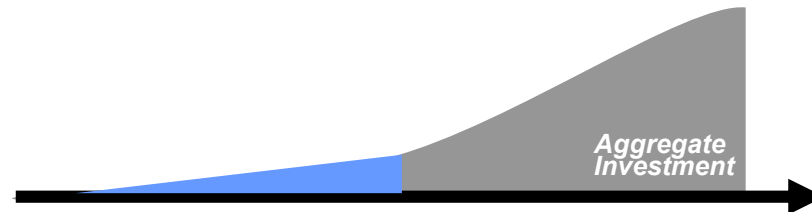
Seed /
Incubator
Window

Clean Energy
Private Equity Fund

Enterprise
Development

Seed
Capital

Investment



Clean Energy Technology or Project

Aggregate
Investment

Mob
for c
and enterprise developments.

Facility



End-User Finance Programmes



Tunisian Prosol Programme

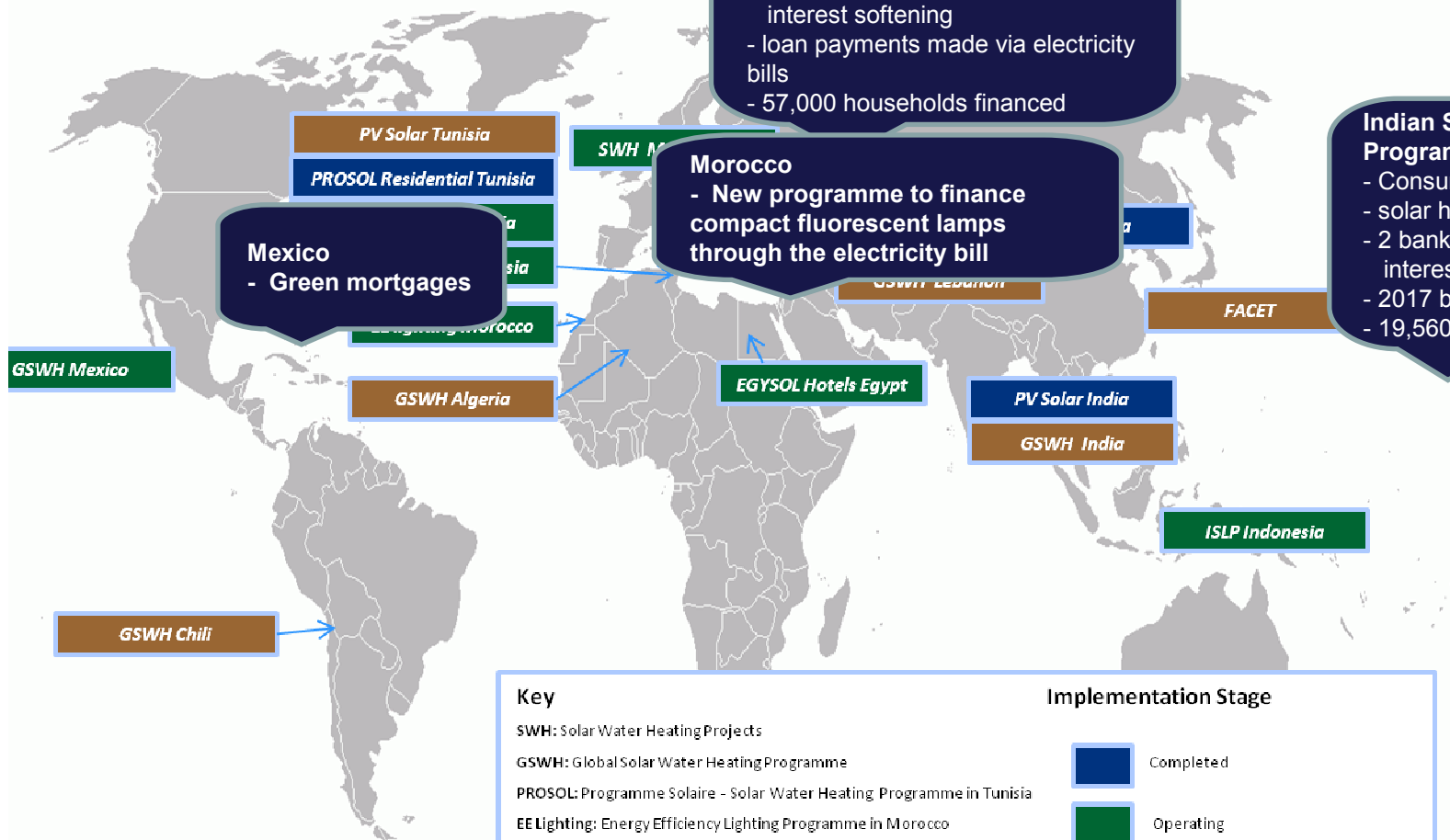
- Consumer financing
- solar domestic water heaters
- four banks offered training and interest softening
- loan payments made via electricity bills
- 57,000 households financed

Morocco

- New programme to finance compact fluorescent lamps through the electricity bill

Indian Solar Loan Programme

- Consumer financing
- solar home systems
- 2 banks offered training and interest softening incentive
- 2017 bank branches
- 19,560 homes financed



Key

- SWH: Solar Water Heating Projects
- GSWH: Global Solar Water Heating Programme
- PROSOL: Programme Solaire - Solar Water Heating Programme in Tunisia
- EE Lighting: Energy Efficiency Lighting Programme in Morocco
- EGYSOL: Egyptian Solar Water Heating Programme
- PV Solar Loan Programme India
- PV Solar project; Photovoltaic solar project in Tunisia
- FACET: Financing Access to Clean Energy Technologies (3 countries Asia)
- ISLP: Indonesian Solar Loan Programme
- GVC: Green Village Credit China

Implementation Stage

- Completed
- Operating
- In Development



SEFI Public Finance Alliance (**SEF Alliance**)

A coalition of public and publicly backed funds and agencies that finance sustainable energy markets development

Addressing:

- What sort of public and public-private funding instruments work best
- Implementation approaches, learning from others successes and failures

Current Members:

California Energy Commission
UK Carbon Trust
Finish Innovation Fund SITRA
FIRA Mexico

Sustainable Energy Ireland
Sustainable Development Technology Canada
CORFO Chile

- Operates in association with 15 member funds of the U.S. Clean Energy States Alliance

Public finance research

- Public Finance Mechanisms (PFMs) to Mobilise Investment for Climate Change Mitigation (2008)
- Catalysing Low-carbon Growth in Developing Countries: PFMs to scale up private sector investment in climate solutions (2009)
- Public Venture Capital Study (2008)
- Public Guarantees Study (2009)
- Approaches to Impact assessment (2008)
- Why Clean Energy Public Investment Makes Economic Sense – the Evidence Base (2009)





Key take-away points

- **Finance is vital, but not sufficient. Dialogue has mainly been on ensuring access to finance for low carbon or climate-resilient infrastructure, but supply is not the only barrier.** Need to stimulate domestic demand and build the capacity to absorb and deploy funds.
- **Future climate funds can maximize their impact through a “readiness” phase and by addressing transaction costs.** Building readiness essential for success of subsequent large-scale programs financed through MDBs and the private sector and lowering transaction costs vital to get the private sector involved.
- **Institutions that address the supply and demand for finance may not be the same (nationally and internationally).** Institutions such as UNEP can help mobilize complementary finance that leverages private capital and large-scale public investment. Existing menu of options to catalyze green investment and build readiness for carbon mitigation, REDD.



Some questions to ask in designing a CTCN

- What can a CTCN hope to achieve? What are its limitations?
- How should the CTCN be structured to create links between existing (and new) technology collaboration activities?
- What gaps exist in international technology collaboration that can be addressed through the CTCN?
- How can the Technology Mechanism help address or avoid some of the challenges and limitations of existing initiatives?
- How can advances in ICT be tapped to deliver more services more effectively at lower cost ?