Annex II

Ways to promote environments and address barriers to technology development and transfer

The following is a submission to the Technology Executive Committee (TEC) from the World Business Council for Sustainable Development (WBCSD) as a response to the request for input on ways to promote enabling environments and address barriers to technology development and transfer in relation to TEC work plan.

For this submission we would like to reiterate our understanding that the role of the TEC would be at a high-level focusing on international policy guidance and advice, gap analysis, coordination, facilitation of activities, fostering cooperation rather than on implementation at a national or regional level which would be the preserve of the Climate Technology Centre and Network (CTCN).

Why enabling frameworks?

Appropriate enabling frameworks can reduce the risk of investment and attract low-carbon technology deployment. The appropriate environment to attract low-carbon investment in available technologies will need to be determined nationally and/or regionally. Countries would be supported by the work of the CTCN to identify and build an environment which is conducive to business investment. The role of the TEC would be to create the international policy framework and guidance to support this. This could include recommendations for enabling frameworks, facilitating a knowledge bank, fostering partnerships to support capacity building and training and working with other institutions to roll out support programmes.

The "right" public framework, or environment, can also enable research and development, and demonstration and piloting early deployment of a range of technologies that support the transition to a low-carbon economy. These "enabling environments' will need broader more focused approaches for specific technologies - these could include public private partnerships, creation of consortia etc. and may require international support policies. Here the role of the TEC for strategic vision and climate public funds could be critical. Examples of these would be in the research, development and demonstration phases of as yet non-commercial technologies including forest genetics, fuel cells, and carbon capture and storage (CCS).

There has been a lot done on technologies that mitigate greenhouse gas emissions, including the full research and development to commercial deployment chain, and mapping out the roadmaps for low-carbon technologies in general and for some specific categories. Less appears to have been done in terms of technologies that could support adaptation and resilience. The TEC could go far in addressing this balance and drawing attention by focusing some work on the gaps including adaptation road maps and action plans. One critical area is the question of climate resilience in the electric utility sector, but other sectors will need to consider the impacts of climate change on their businesses.

The business case

Current estimates by IEA in the 2011 WEO estimate that based on government pledges and plans, 38 trillion US dollars of in cumulative spending between 2011 and 2035 will be needed in energy supply-related investment. Roughly two thirds of this will be in developing countries. Such a scale of investment will have an enormous impact on a range of actors- including all businesses along the value chain, academia, workers and communities. At the same time, there will need to be considerable investment in energy efficiency so that economies can grow while reducing energy use.

Business is the main source, developer and deployer of technologies in the world. Business carries out the full range of the technology cycle from research through to deployment. At each

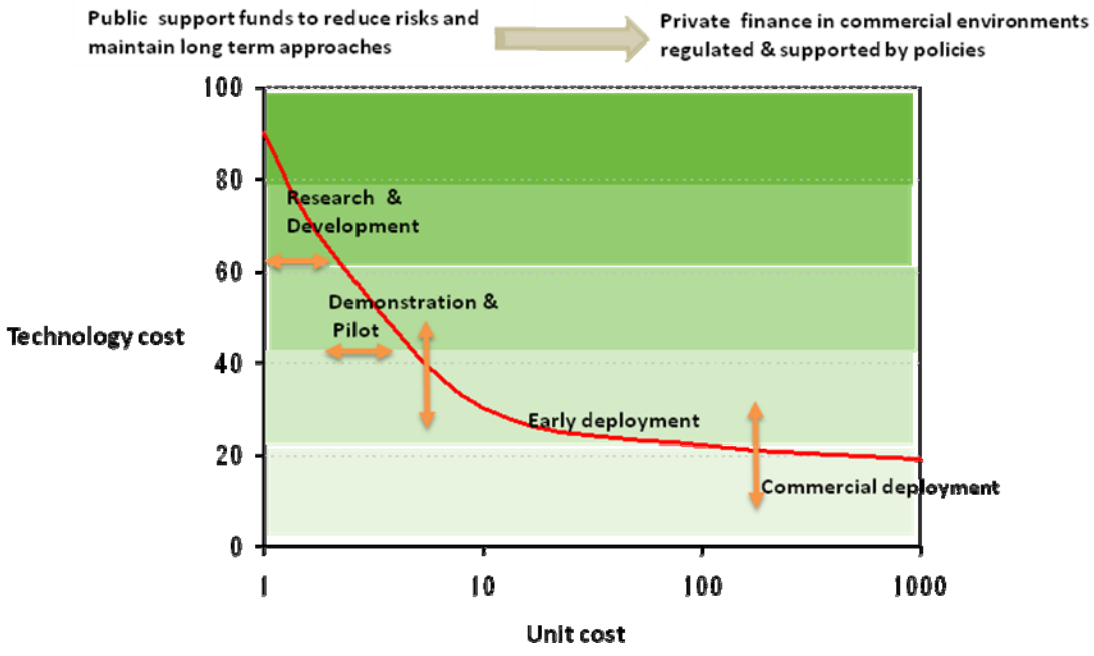
stage there are commercial reasons for the activity. Business carries out research to develop new products for a new demand or a potential future demand, to improve existing technologies and to remain competitive. Business deploys technologies as part of a **commercial** activity – either as sales to another concern, as a part of its own project or investment. It is this commercial driver that supports the continuing development of new products and deployment of technologies.

Business has finite resources and hence invests its capital and resources where it can be put to best use, ie in projects that produce a sufficient return to fund future investment. Good projects or proposals tend to get the necessary financial backing and business support. There are already flows of circa 55 billion US dollars[1] flowing annually from the private sector to developing countries for low- carbon technologies, but the estimates indicate that this needs to be seriously scaled-up. How can this be done?

There are many advantages in learning from what has worked and is working to allow clean energy investments. There is no single factor or set formula that attracts business investment rather a mix of elements ranging from government strategies and policies, regulations, capacity, financial and economic considerations and legal frameworks which work together to make projects attractive. Different technologies and the different stages of the technology cycle have different need-mixes to reduce the risks and increase the incentives for investment.

In the case of the different stages of technology, as one moves from left to right along the curve the considerable costs and risks relating to technology research, development and demonstration give way to a commercially viable technology which is affordable.

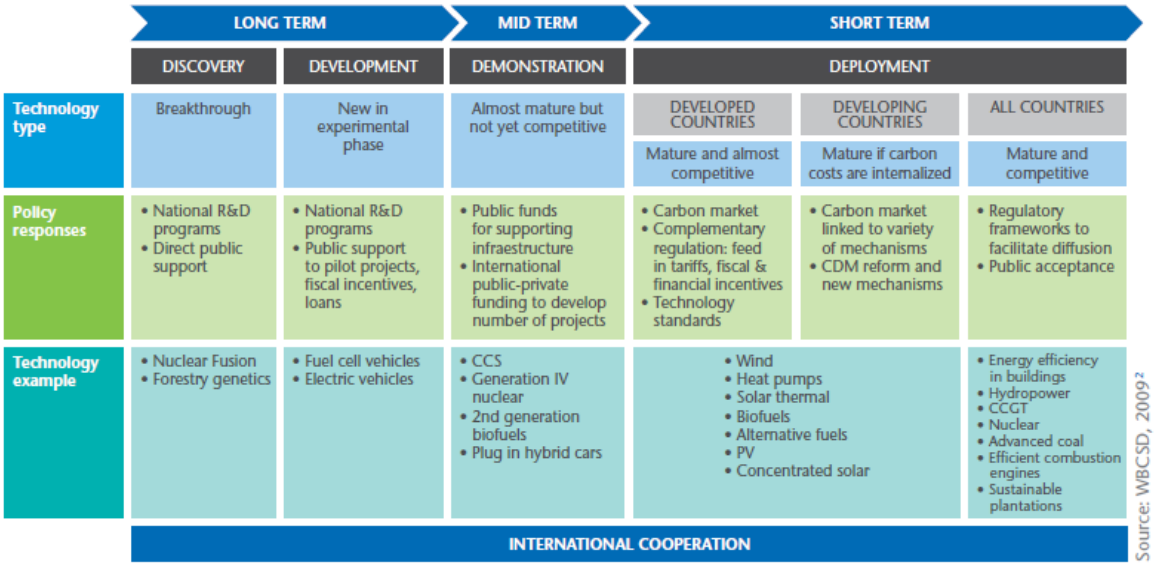
The diagram below illustrates different stages:



The TEC should consider developing its strategy using a framework like this. What is needed to ensure commercial deployment of low-carbon technologies? Which technologies in the pipeline could make the most difference and how to accelerate implementation? What needs to be supported for pilot and demonstration projects and where? What are the broad range of policies available that incentivize the deployment of these technologies? It is assumed that the CTCN would advise countries on which ones to adapt for their specific circumstances.

[1] CPI 2011 The Landscape of Climate, Climate Policy Initiative, October 2011

The potential policy responses are illustrated in more detail with real technology examples in the following diagram taken from the WBCSD Enabling Frameworks publication of 2010:



What are the enabling frameworks?

The following are the enabling frameworks that can help feed the drivers of business investment and catalyze scale-up of low-carbon investments in clean technologies in developing countries?

1. Strong signals from governments for low-carbon growth nationally and internationally, either through targets or regulatory measures

2. Adequate institutional frameworks that provide stable policies, transparent investment regulation and supportive local conditions

3. Appropriate absorptive capacity in institutions, business and society including a functioning education system, a receptive environment and targeted capacity building programs

4. Economic and financial incentives to bridge the cost gap for low-carbon solutions and to make them commercially viable

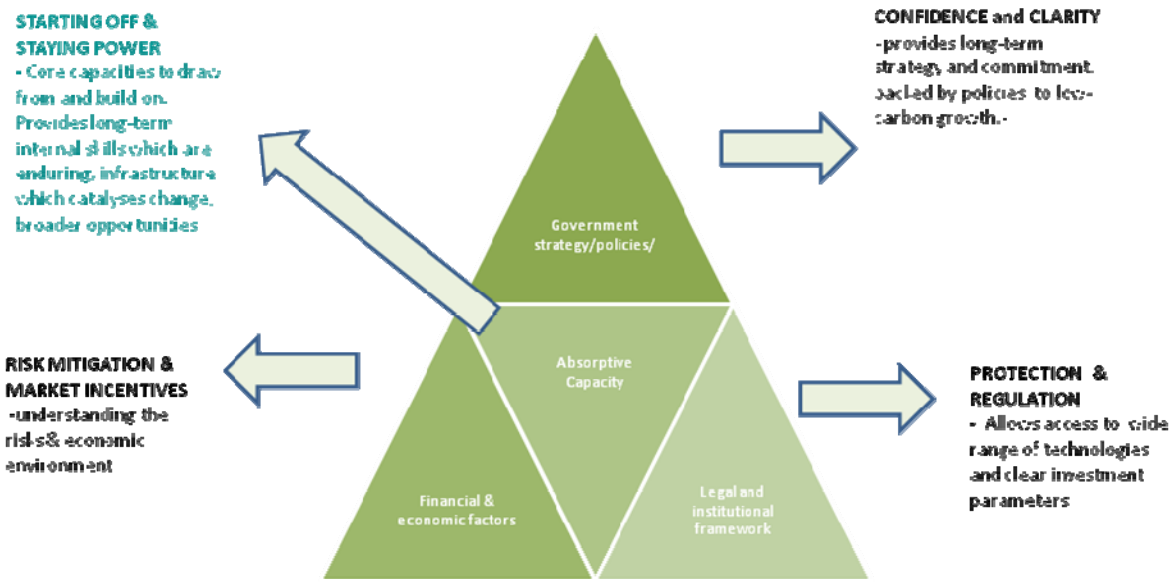
5. Removing barriers such as perverse subsidies, introducing economic incentives and consumer outreach to maximize energy efficient measures.

These frameworks may be found in more detail in some of the work that the WBCSD has done on technology development and diffusion.

WBCSD member companies produced "Enabling Frameworks for Technology Diffusion" and "Innovating for green growth" as contributions to the EGTT discussions in 2009 -2010 These publications provide clear messages from business as well as providing more specific needs from the perspective of different sectors – power, cement, road transport, buildings and forestry. These publications are available on the WBCSD website.

WBCSD has worked with its members to disentangle the critical **drivers** for business investment – which accounts for more than 85% of foreign direct investment.

- Gaining ***competitive advantage*** in new markets
- Responding to a ***growing market*** for products, services etc
- Attracted by a ***supportive and vigorous business*** environment
- Provided with access to ***reliable information*** to understand the risks – financial, technical and manpower



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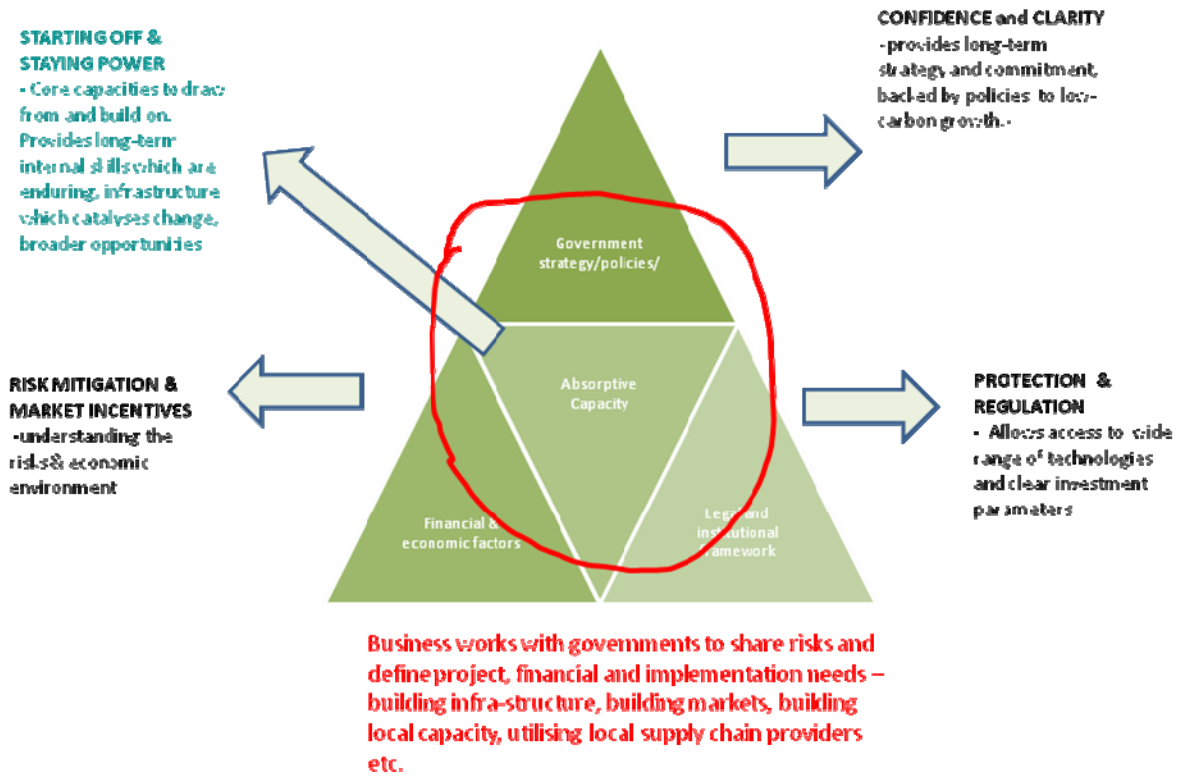
Of the above, **developing absorptive capacity** in developing countries is an essential pillar for low-carbon growth, which is often underestimated or even neglected. This involves investing in people, infrastructure and institutions:

- **people –** education at all levels, developing local business capacity, and ensuring appropriate training for government officials and municipalities, developing a technically skilled workforce and managerial capacity.
- **infrastructure** – a good road network to facilitate transport of resources, products, and workforce, bridges, grid systems, reliable electricity supply, suppliers, setting up industry clusters
- **institutions** – banking sector, support the development of the market, regulatory framework, protect IPR, disseminate information to public and local businesses, provide a secure environment.

Critical role of capacity-building

In this submission we want to focus on the importance of ***capacity building***, since companies believe is a fundamental and often neglected element in the development and deployment of low-carbon technologies.

Building capacity requires new forms of collaboration between the public and private sector. The private sector not only needs certain skills in order to invest but will also contribute to building up even more specialist skills during its investment. These partnerships have the potential of sharing knowledge and creating value.



Identifying and building capacity

Adequate capacity to develop and use technology is an important consideration for business when planning to invest in any country, as is the appropriate choice of technology. Below are some examples of what can support business investment:

- **Build trust between technology developers and users.** Many projects fail in developing countries because they use technology that is inappropriate due to lack local technical and managerial skills, ill-defined ownership, or lack of infrastructure. Any new technology framework should minimize these risks to ensure efficient diffusion of the appropriate technologies. Technology assessments should take a holistic approach that encompasses "host-country" capabilities with the technologies needed.

TEC should identify any gaps in the overall TNA approach which may need addressing to assure holistic approaches to technology deployment

- **Develop local management capability.** One of the biggest obstacles to technology deployment is the availability of skilled local business partners in some developing countries. For energy projects, especially renewable energy, a local partner who can put the deal together is critical. This demands business and political skills, along with strong ethics.

TEC could facilitate the sharing of appropriate regional and national information on potential partners

- **Be specific in identifying the needs.** Clear requirements create the opportunity for tangible solutions and are more meaningful and actionable than vague "we need technology" demands. Products and technology identified through systematic government processes including the Technology Needs Assessment under the United Nations Framework Convention on Climate Change (UNFCCC) are more likely to be addressed successfully.

TEC should identify any gaps in the overall TNA approach which may need addressing to assure holistic approaches to technology deployment

- **Collect necessary data for the implementation of appropriate policies appropriate policies**. Solid data is a prerequisite for policy-makers and business. This will help policymakers design the most cost-effective policy options and impact assessments, while business can reduce uncertainty and thus risk premiums. Often there is a substantial lack of reliable statistical data on issues such as energy use, infrastructure, or demand.

TEC should foster partnerships with development agencies and national institutions to promote improved data collection and data sharing

- **Be prepared to partner with business for solutions.** Many companies look to developing countries for growth opportunities. A country can create a bigger opportunity by selecting a few key technologies and competitively seeking partners who will work with them over the longer term on research, application development and deployment. Focusing a country's academic resources on the most appropriate technologies is crucial.

TEC could be instrumental in raising the awareness level on the opportunities for adaptive technology development and creative research possibly through competitive funding and prizes.

- **Address installation and maintenance as a key element of technology development or technology deployment**. Much of the focus around technology diffusion is on the manufacturing of technologies. For many energy technologies, scale and experience are needed to ensure quality products at cost efficient prices. Achieving indigenous manufacturing in every country is unrealistic. But building the infrastructure for these technologies and their maintenance, can lead to long-term, high-quality jobs related to installation and servicing of equipment. Utilize existing expertise.

TEC should foster partnerships between business, institutions, governments and training centres to build the next generation of skilled workers

Accessing the necessary skills

To create a pool of skilled workers and trainers, capacity building programs should be developed. These could utilize existing expertise by:

- **Establishing training and support services as a commercial activity.** Many large multi-nationals and consulting firms have capacity to provide detailed training and technical support. However, it would be rare for a business to divert those resources from other commercial activities.
- **Using external donor funds.** Traditional foreign aid projects are an effective mechanism to help address specific needs. This is especially true in areas such as the design of the regulatory system or staffing permitting processes. These are inherently government functions and critically important to enabling technology deployment.

TEC should foster partnerships between business, institutions, governments and training centres to build the next generation of skilled workers

Expanding the opportunities

- **Bundle opportunities for implementation.** Companies invest in countries and technologies that fit into their business strategy. Sometimes a single country might not be attractive for investment, but bundling different possibilities could create opportunities for implementation:
- **Bundle customers (or countries).** Companies will expend significant resources doing business in a country like China and India because the opportunities are immense. It is much harder to justify that effort in a small country. If countries with similar needs around a specific technology type are grouped together, the larger opportunity they present would be much more attractive for business.

- **Bundle solutions or services.** Some companies would be interested in providing a larger service, e.g. equipment or operation and maintenance across a range of infrastructure technologies, to create a bigger opportunity and present the upside of a long-term business relationship.
- **Bundle standard packages.** Standardizing bundled solutions or technology offerings to customers with similar needs is another way to speed up deployment. If the need for customized engineering can be reduced, costs typically come down.

TEC could be instrumental in providing sources of information – data, contacts, TNAs, projects to help guide prospective business investors

Real examples of partnerships

Case Studies

For WBCSD members these activities are part of their everyday activities. Over the years they have gained experience with investments in different corners of the globe and in different sectors. These provide valuable experiences and lessons of what to do and importantly what not to do. Failures provide powerful messages.

The power sector is a critical sector for all economies and in particular those which are still developing. It is also a sector which accounts for a growing high proportion of the emissions of most countries (Figures – circa 20%). The Global Sustainable Energy Partnership (GSEP) previously the E7 and E8, has been working with UN Energy to develop a recommendations for policy makers and private sector actors on Public Private Partnerships to promote deployment of low-carbon and zero- emitting electricity technologies.

These recommendations were developed following surveys with the actors involved – initially private sector and stakeholders, and then including the public sector and MDBs.

The case studies and recommendations for mutually effective PPPs are found attached in Strengthening Public-Private Partnerships to accelerate Global Electricity Technology Deployment 2011 & 2012 which may be accessed at **http://www.e8casestudies.org** and on page 45 of the report at
at **http://www.globalelectricity.org/upload/File/2nd_edition_strengthening_ppps_-_joint_report_gsep-un-energy_2012(3).pdf**
