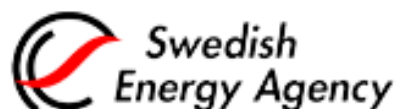


Project name:	Forging International Finance Collaboration <i>Technology Platform Finance Initiative</i>
Project type (level):	Workshop (International)
Date and venue:	21 June 2012, City Conference Centre, Stockholm, Sweden
Agenda:	Annex 1
Workshop summary:	Annex 2
Participant list:	Annex 3
Project rationale:	During the preparatory discussions of the High level meeting that launched the Technology Platform in October 2010, many stakeholders called for the IEA to launch a Finance Initiative in this framework. A first meeting was organised in June 2011 to launch the initiative and explore activities of the Technology Platform stakeholders in the field of low-carbon technology financing. The workshop titled “Forging International Finance Collaboration” organised in June 2012 aimed to evaluate how energy technology deployment can be scaled up, taking into account the views of the investment and finance community. In particular it was designed to explore the following essential issues: 1. Provide a state of play of current policy and investment trends for the development and deployment of low-carbon technologies; 2. Assess existing barriers to up-scaling investments in low-carbon energy technologies; 3. Explore options for facilitating accelerated investment in low-carbon technology deployment; and 4. Identify gaps in international collaboration to define key projects that the Technology Platform Finance Initiative could help address in future. This workshop, kindly hosted by the Swedish Energy Agency, gave particular emphasis to case-studies detailing what does and does not work in the financing of low-carbon energy technologies, exploring barriers and solutions related to technology and regulatory risks as well as public-private risk sharing. The workshop received substantial inputs from the IEA Technology Network through the provision of specific experiences drawn from the Implementing Agreement for Climate Technology Initiative (CTI) and the Implementing Agreement for Renewable Energy Technology Deployment (IEA-RETD), as well as other stakeholders.
Project outputs:	Workshop discussions showed a broad consensus among participants on the fact that low-carbon technology use, in particular renewable energy, continues to grow, despite remaining policy and other barriers. We are no longer talking about niche sectors for low-carbon technologies deployment but rather substantial industrial change. However, workshop participants agreed that much more could be done to substantially scale up and accelerate investment in low-carbon technologies. Moving from a niche sector to a substantial industrial sector implies continued but also renewed government support and further collaboration between public and private sectors. The workshop determined a series of proposals made for the Technology Platform Finance Initiative to take forward, namely: 1. Develop a set of policy recommendations to Governments on how to facilitate scaled up investments in low-carbon energy technologies in the short to medium term - Use the Technology Platform to coordinate the development of a comprehensive report containing a series of policy recommendations on how to scale up investments in low-

	carbon energy technologies. This report could form part of IEA inputs to the upcoming Clean Energy Ministerial meetings; 2. Facilitate further dialogue workshops with interested stakeholders - Organise future workshop(s) on the topic of financing low-carbon technologies and/or include this topic in forthcoming Technology Platform events; 3. Focus on the Mediterranean specific issues for financing low-carbon technologies deployment - Include the consideration of finance issues within the forthcoming Technology Platform workshop on Renewable Energy in Mediterranean, due to be held in Rome (possibly the 3-5 October 2012), in partnership with the IEA Renewable Energy Working Party, the Italian government and Res4Med; and, 4. Consider the development of database of existing investors and investment flows – Together with IEA working parties, the Technology Platform will consider development of a database of existing investors (on global, regional and/or national basis) that could notably feed into CTI work programme. This project could potentially be coupled with a request from previous meeting for the development of a benchmark of investment flows. The Technology Platform will continue to engage with partners to further explore the progression of collaborative efforts as recommended by this workshop, in line with above stated project outputs.
Project partners:	• International Energy Agency (IEA) • Implementing Agreement for Climate Technology Initiative (CTI) • Implementing Agreement for Renewable Energy Technology Deployment (IEA-RETD) • Swedish Energy Agency
For more information:	Contact the Technology Platform Email address: TechPlatform@iea.org Helpdesk telephone no.: 00 33 1 40 57 67 82 <i>Visit our website for further information on the Technology Platform and related activities:</i> www.iea.org



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Annex 1: Agenda

8:30-8:45	Registration and coffee
8:45-9:00	Welcome and introduction by Bo Diczfalusy , Director of Sustainable Energy Technology Policies, IEA
9:00-10:30	Session 1: A global perspective on low-carbon energy technology finance and related policy development This session focused on high-level perception issues: define real/perceived risks and their impact on investment (risks include but not limited to: political; regulatory and policy; technology; public acceptance; market; climate) as well as foreseeable technology specific issues for investment: technology obsolescence, combined technologies and grid issues, non mature technologies (demonstration). <i>Chair: Eric Usher, Manager, Seed Capital Programmes, United Nations Environment Programme</i> • Markus Wrake, Head of Energy Supply Technology Unit, IEA • Rana Adib, Policy Advisor, REN21 • Martin Gavelius, Head of Energy, Utilities & Mining, Corporate Finance, PricewaterhouseCoopers Sweden
10:30- 10:45	Coffee break
10:45-12:15	Session 2: Barriers and gaps: Is low carbon energy technology finance happening fast enough? Why not? This session discussed information shortfalls, perception issues of investors about various risks; technology risk: RD& D, de-risked commercial deployment; and regulatory risk: less successful examples in both OECD and BRICS countries. What did not work? Why not? <i>Chair: Peter Storey, CTI PFAN Global Coordinator</i> • Hans Jørgen Koch, Chair of IEA-RETD • Eric Usher, Manager, Seed Capital Programmes, United Nations Environment Programme • Stefan Jakélius, Investment Director, Swedish Industry Fund
12:15- 13:30	Lunch
13 :30-15 :00	Session 3: Addressing the barriers: What are the available solutions? This session discussed the available solutions to addressing barriers to enhance low-carbon technology investment. An emphasis will be given to solutions that include knowledge and education as well as risk sharing: blending private-public risk allocation in order to ease investment flows; policy incentives, etc. What works well? Why? <i>Chair: Hans Jørgen Koch, Chair of IEA-RETD</i> • Peter Storey, CTI PFAN Global Coordinator • John Howchin, Secretary General, Swedish National Pension Fund • Lars Bierlein, Head of Program Office, Business Innovation, E.ON Sverige AB • Berta Pesti, Technical Specialist Climate Change, United Nations Development Programme
15:00-15:15	Coffee break
15:15-16:45	Session 4: Moving forward: What can the Technology Platform do to help? This session synthesised discussions of the day and define next steps for the Technology Platform and envisage future collaborative efforts. <i>Chair: Stefanie Held, Head of Technology Network Unit, IEA</i>
16:45-17:00	Conclusions and closing remarks by Bo Diczfalusy , Director of Sustainable Energy Technology Policies, IEA

Annex 2: Workshop summary

The workshop discussions were held under Chatham House rules therefore the views expressed haven't been attributed to specific individuals. This summary reflects the general views of the discussions and not necessarily that of the IEA or its member countries.

This workshop was designed to look into the following issues:

1. Provide a state of play of current policy and investment trends for the development and deployment of low-carbon technologies;
2. Assess existing barriers to up-scaling investments in low-carbon energy technologies;
3. Explore options for facilitating accelerated investment in low-carbon technology deployment; and
4. Identify gaps in international collaboration to define key projects that the Technology Platform Finance Initiative could help address in future.

The below summary will focus on the three first points. For more information on key proposal for the Technology Platform to take forward, please refer to the above section entitled "project outputs".

Where are we today?

In comparison with today's highly centralised electricity generation system, IEA analysis from the *Energy Technology Perspective* (ETP) 2012 explores how a more distributed system supported by an increasingly diverse portfolio of technologies will require a different approach to policy making as well as smarter grids. For example, under the ETP 2 degree scenario¹, it is expected there will be 90% more electric vehicles in 2050, which in turn will provoke increased demand for electricity but also new system and infrastructural opportunities.

Government targets for technology and policy until 2020 are very encouraging, but some questions remain about how much corresponding investment will need to be put forward and where the money would come from. IEA analysis demonstrates that USD 140 trillion investments are required under 2DS in total until 2050, with over half of investment needed to decarbonise the transport sector. Significant investments are expected to go into wind and solar but also other technologies such as nuclear, biomass and gas among others. In addition, over time, investments are expected to shift in support of further energy efficiency measures, in particular in the building sector.

Thanks to Government support and despite remaining policy uncertainty, renewable energy use continues to grow: REN21 report indicates that in 2011, more than 20% of global electricity was produced from renewable energy. Accelerated deployment of low-carbon technologies is technically feasible but it requires the establishment of new business models and policy frameworks to guard against market failure. Further Governmental action is needed, that could include supporting cash flows into these low-carbon technologies but also supporting the development of new business models that would alleviate the risk-reward ratio and the absolute capital cost for investors.

Recent analysis² shows that investments have been growing, but with a possible drop off in Q1 of 2012. It is too early to confirm the significance of this observation, but clearly any sustained decline is not a positive sign. As discussed at the last Clean Energy Ministerial meeting in April 2012 and stated by the IEA in its *World Energy Outlook 2011 and reiterated in its Energy Technology Perspectives 2012*, the window of opportunity for governments to meet their international commitment to limit temperature rise to 2 degree Celsius by 2050 is fast closing. Substantial policy changes are urgently required as investments made today will determine the energy system that is in place in 2050. Additionally, the group highlighted that entering the low-carbon economy represents an opportunity for governments to combat the economic crisis by investing in and stimulating global green growth while at simultaneously alleviating energy security concerns through the diversification of their energy mix.

¹ The 2DS aims to reduce energy-related carbon dioxide (CO₂) emissions by 50%, compared to 2005 levels.

² BNEF 2012

Barriers and gaps to low carbon energy technology finance – key issues

The below section summarises the statements as well as related questions and issues highlighted during the group discussions.

1. Market preparedness in developing countries:

- In developing countries, the key issues related to low-carbon energy technologies are energy access, technology transfer and access to finance, as well as project monitoring (predominantly across very decentralised systems). Non mature markets are often not equipped to support/foster low-carbon technology deployment, both in term of institutions and enabling regulations. The group questioned whether there was clarity on what positive and negative elements could develop economies take out of European/OECD experience in deploying energy technologies, highlighting further work in this area was needed.

2. Market transparency and opportunities:

- For private sector stakeholders, accelerated investment in low-carbon technologies is hindered and stems from issues relating to cost efficiency and predictability. Lack of market transparency, coupled with a volatile and unpredictable policy and regulatory landscape, is compounding traditional risks associated with technology and project development. What measures could alleviate these factors and foster investor comfort and willingness to make investments?
- Market success also base on non-economic factors such as public acceptance of a given technology. Indeed, while public opinion polls usually show that large majorities support renewable energies – including wind energy – many projects meet with resistance from local communities or environmental organisations. Social acceptability is a key dimension to policy-makers' decisions that can affect industrial choices and thus create investment thresholds within a given market. What can be done to ease social acceptability towards certain technologies and support innovative government choices?
- There is a need to think about the geopolitics of what climate change and mitigation solutions mean for trade flows and policies. What positive/negative impact do climate change policies and mitigation options can have on internationally traded goods, including technologies?

3. Risk-reward ratio:

- The group posed the following questions, notably based on the findings from the recently launched "Finance RE report" developed by the IEA-RETD implementing agreement³:
 - i. Investors tend not to invest in early stage technologies because of their inherent risks. What could be done to address the lack of early stage development funding and move through project development phase?
 - ii. There is a great need for support to cash flows into low-carbon technologies as well as management of the capital cost for investors. What role can play the governments in managing these issues?
 - iii. Energy efficiency measures imply high investment upfront but offer substantial returns in short term. How best can investors be encouraged to appreciate potential benefits of investing in energy efficiency?
 - iv. There is a great concern among investors about high transaction costs. These costs imply that investors cannot invest in small projects. What solutions could be found to alleviate/reduce transactions costs?

4. RD+D prioritisation:

³ Available at <http://iea-rettd.org/archives/publications/finance-re>

- Today, we are no longer talking about niche sectors for low-carbon technologies but rather substantial industrial change. Therefore, a key question for investors and policy makers is to determine what will be the energy system of tomorrow and act accordingly;
- Given the global economic crisis, it is commonly observed that government investment in energy R&D is slowing and innovation is falling down the political agenda. In response to this situation, what type of industrial model do we need to stimulate innovation?

5. Policy uncertainty:

- There is great uncertainty over financial support schemes, notably in Europe. There is a pressing need for more clarity and predictability over support schemes life cycle and mechanisms. How can government address these issues of sustainability and education?
- In time of budget austerity, support schemes can represent a real burden to countries budget. How to address this issue? Would it be a solution to support the development of schemes at other levels than national level (e.g. at the regional or sub-national levels)?
- There is progressively a greater awareness in linking renewable energy technologies and energy efficiency measures; however this is not yet translated into policies. How can these links be reinforced in policies?

6. Technology needs and opportunities:

- The development of a more distributed system will allow more diverse portfolio but will also require a different approach to policy making and finance, including as regards to infrastructure development (e.g. smart grids);
- How do we get the timing right – which technology should be deployed first to unleash broader deployment of the whole technology set relevant to a given country energy mix? What about transition technologies?
- Whilst it is commonly agreed that money is available and there are lots of project, some match-making organisations, such as CTI-PFAN, are concerned about the fact that few of them are packaged or presented in a way which enable them to access investment. What can be done to make money and projects meet more quickly?

Addressing the issues – some options

The below section summarises some options that were suggested by the group discussion, even though some statements are quite general and do not allocate responsibilities to specific body.

1. Build on international collaboration and existing tools:

- The Technology Mechanism of the United Framework Convention for Climate Change (UNFCCC) is starting to grow, with inputs from the IEA, but more coordination efforts are needed, notably to inform projects supported by the Green Climate Fund;
- Evaluate the outcomes of the United Nations “Sustainable Energy for All” Initiative for 2012, and explore how efforts could be pursued in support of its three key objectives of ensuring universal energy access; doubling the share of renewable energy in the global energy mix and doubling the global rate of improvement of energy efficiency by 2030;
- Green growth concepts, discussed at the Rio+20 Summit, need to be further explored to use the economic crisis as a window of opportunity for entering into a low-carbon economy (e.g. links with green job opportunities, etc);
- Now that IRENA is getting up to speed, better coordination of efforts between corresponding initiatives, notably on initiatives related to increase renewable energy awareness;
- There is a growing common agreement that one solution does not fit all. Therefore, national leadership can help (e.g. through Nationally Appropriate Mitigation Actions). There is a need for facilitating/ giving advice to governments on how to better link with their industry.

2. Promote short term policy measures:

- Set a meaningful global carbon price, at least three times higher than current prices within the EU Emission Trading Schemes (EUETS);
- Conventional energy is still subject to substantial subsidies, thus there is a pressing need to reduce/suppress subsidies to fossil fuels. Indeed, as demonstrated in the *World Energy Outlook 2011*, subsidies distort markets and can impede investment in clean energy sources. Thus removing fossil-fuel consumption subsidies could make a big contribution to meeting energy security and environmental goals.

3. Educate on possible technology choices:

- Energy efficiency measures in the end-use sector are the most cost effective policies to introduce in the short term. For instance, fuel efficiency in the transport sector offers huge benefits in short time frame;
- Smartening the grid is necessary to allow sustainable deployment of low-carbon technologies and is very interesting in terms of returns as the benefits go far beyond the initial investment;
- Raise awareness on options for replacement of traditional fossil fuels in energy supply, as notably demonstrated in IEA technology roadmaps. Going further, the development of technology specific How2Guides⁴ will offer countries the right methodology and policy tools to develop their own national roadmaps in support of their efforts to diversify their energy mix while diminishing the use of traditional fossil fuels;
- Identified need for the development of long term and large scale projects that could be developed at the regional level and would be easier to fund;
- Identified need for packaging and bundling of groups of smaller projects which could then facilitate securitisation.

4. Catalyse collaboration between all stakeholders:

- Facilitate policy makers' engagement with the investment community to help them understand the opportunities and not just the cost of low-carbon technology deployment;
- Identified need for Governments to get in contact with new institutional investors and MDBs and corporate stakeholders to increase acceptance of renewable and energy efficiency as part of broader economic agenda;
- In some countries, there are very few investors at the national level. Therefore, there is a need to map existing options (potentially at the national level – see point 5 below) and to facilitate collaborative efforts between national investors and European/regional based capital funds (or other regional funds) where appropriate;
- There is a pressing need for long term policy stability and where necessary harmonisation of policy frameworks within neighbouring markets;
- Identified need to benchmark options/ case studies of successful cross-industry partnerships that could be repeated on a replicable basis.

5. Develop new replicable tools:

- Develop innovative business models to deploy the technologies into the market which aim to integrate and use a technology to deliver a solution or service. Dissemination of information on successful business models could support the development of a replicable pattern;
- Improve risk management through better contracts, information and knowledge exchange;
- To address the political risk and different levels of sophistication of markets in developing countries, there is a need for tools and financial instruments to allow financial flow entering more freely in these countries;

⁴ The IEA launched in 2012 a new initiative, so called **How2Guides**, that aim to develop a series of technology specific policy and methodology tools for roadmap development at the national level. Four projects are currently underway on Smart Grids in Distribution Networks; Wind Energy; Bioenergy and Solar Energy.

- Governments hold a responsibility to establish strong and stable policy frameworks to lower the amount of required finance, as well as cost of raising such finance via mitigating risk where appropriate;
- Based on European/OECD experience, develop a (business) model for low-carbon technology deployment pertinent to developing countries;
- Public finance alone is insufficient to meet demands of climate challenge; there is a need for greater volumes of private finance. A tool or framework able to catalyse public and private finance could be developed to facilitate increase private sector financial flows into clean technology projects;
- Identified need for the development of a database of existing investors (on global, regional and/or national basis) that would notably feed into CTI work programme;
- Identified need for the development of a benchmark of investment flows.

6. Build awareness:

- Most investors have a financial background and do not understand subsidies mechanisms. There is a need for more education and information sharing between government and investors community;
- There is a limited alignment between climate and sustainable development policies, therefore climate finance should be better mainstreamed into planning and development policy;
- At the macro level, there is always money available for investment whether from institutional or private sources, but this is not necessarily the case at project level. Besides, on the ground there is a clear lack of suitably qualified and experienced personnel to efficiently move / channel the large sums of donor money coming into the places where it needs to be moved. Especially in developing countries, policy makers on the ground (sub-national level notably) lack sufficient skills on the ground to make investors invest in the right projects. Training modules could be developed to support project development, focusing on how to best invest in low-carbon technology deployment projects, what process and who to involve;
- There is a pressing need for high level political commitment from governments to low carbon energy technology, so to enable large scale investment from both industry and other investors;
- Increase information exchange on finance duplication, possibly with focus on Mediterranean area;
- Provide practical examples of positive and negative case studies i.e. those that go wrong.

Annex 3: Participant list⁵

Last name	First name	Organisation	Position
Adib	Rana	REN21	Policy Advisor
Bahr Ljungdell	Josephine	Swedish Energy Agency	Director, International Secretariat
Bierlein	Lars	E.ON Sverige AB	Head of Program Office, Business Innovation
Cebeci	Seda	Ministry of Development Turkey	
Cunz	Peter	OFEN, Switzerland IEA Committee on Energy Research and Technology (CERT)	Chair
Gauvin	Claude	Natural Resources Canada	Director of Energy Technology Policy
Gavelius	Martin	PricewaterhouseCoopers Sweden	Head of Energy, Utilities & Mining, Corporate Finance
Guldbrand	Lars	Ministry of Enterprise, Energy and Communication, Sweden	Senior Adviser, Division for Energy
Gurmeric	Murard	Ministry of Development Turkey	Head of Transportation, Energy & Logistics Department, State Planning Organisation
Hori	Shiro	ANRE, Ministry of Economy, Trade and Industry, Japan	Senior Policy Advisor for International Affairs
Howchin	John	Swedish National Pension Funds	Secretary General
Jakélius	Stefan	Swedish Industry Fund	Investment Director
Koch	Hans Jorgen	Working Party on Renewable Energy Technologies (REWP)	Chair
Mahajan	Devinder	Department of State, United States	Jefferson Science Fellow
Martin	Steve	Department of Energy and Climate Change, United Kingdom	Senior Policy Advisor
Nassiep	Kevin	National Energy Development	Chief Executive Officer

⁵ Some of the above persons were unable to attend the meeting, but requested their involvement in the finance initiative be maintained beyond the workshop.

		Institute, South Africa	
Nordlander	Mikael	Vattenfall	Senior Technical Analyst
Orletskaia	Liudmila	Inter RAO UES, Russia	Science & Technology Council Coordinator
Paula	Michael	Fed. Ministry of Transport, Innovation & Technology Austria	Energy & Environmental Technology Unit
Pesti	Berta	United Nations Development Programme	Technical Specialist Climate Change
Pickup	Mark	Ministry of Economic Development, New Zealand	
Ponce de Leao	Teresa	National Laboratory of Energy and Geology, Portugal	President
Rantil	Michael	Implementing Agreement for Climate Technology Initiative	Chair
Ringborg	Catherina	Solarus AB	Director
Ryszkowsky	Adam	Ministry of Economy Poland	
Storey	Peter	Implementing Agreement for Climate Technology Initiative - Private Financing Advisory Network	Global coordinator
Sunér Fleming	Maria	Confederation of Swedish Enterprise	Director Energy and Climate Policies
Usher	Eric	United Nations Environment Programme	Manager, Seed Capital Programmes
Vandermaelen	Ludwig	Federal Public Service Economy, Belgium	Policy Advisor
Ziegler	Okko	Ministry of Foreign Affairs, Italy	Energy Specialist
IEA Secretariat			
Diczfalusy	Bo	International Energy Agency (IEA)	Director of Sustainable Energy Policy and Technology
Wrake	Markus	IEA	Head of Energy Supply Technology Unit
Held	Stefanie	IEA	Head, Technology Network Unit
Gourdin	Marie-Laetitia	IEA	Energy Analyst, Technology Network Unit
Louis	Diana	IEA	Technology Network Unit



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LOW-CARBON ENERGY
TECHNOLOGY PLATFORM

Balitrond

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Technology Network Unit