

Four Questions for the May 1 RE&EE Advisory Committee Discussion

To facilitate discussion by the Advisory Committee of its future direction and priorities, members of the Renewable Energy Subcommittee asked participants to respond to four basic questions about their views on the industry, market, and policy priorities.

The four questions are:

Question 1: What are the top two or three macro conditions impacting your company/industry today?

Question 2: What are the top (one to three) sections of the value chain that your firm/industry expects to be the major export area(s)?

Question 3: What are the top two or three countries/regions that your company/industry expects to be exporting to in the next few years?

Question 4: What are the top two or three policies needed for the US government to support your export plans?

To begin the discussion today we have provided copies of the responses to the members of the Advisory Committee. The respondents will each make brief comment on their responses, if they wish. Each should be not more than 1-2 minutes.

Respondents are: Astonfield Solar, Capstone, Covanta, DLZ Corporation, First Solar, Gamesa, GEA, Leeco Steel, Mage Solar, Rushton Atlantic, Stella Group, Tow Path, and Verdant Power.

After their comments, individuals have been asked to provide some comments to synthesize the responses to each question. Those will be:

Synthesis: Presentations (2 minutes each):

- Question #1, Joey Neuhoff,
- Question #2, Karl Gawell,
- Question #3, Scott Sklar, ,
- Question #4, Jennifer von Bismark and John Purcell

We hope this will set the stage for a robust discussion, as well as questions and answers, involving the entire Advisory Committee.

Thank you,

The Temporary Renewable Energy Subcommittee

Astonfield Solar: I am providing this response as an interested participant in the solar industry.

Question 1: What are the top two or three macro conditions impacting your company/industry today?

- **Currency Volatility** – the global solar supply chain typically prices equipment in USD or EUR regardless of the source of manufacturing, whereas payment for electricity is often in local currency. While forex debt facilities can dramatically lower the cost of financing for a solar project (and thus the resulting cost of generating electricity from a solar plant), the volatility in foreign exchange rates creates a large cost of hedging the foreign currency that often makes the option unviable, or at least less attractive relative to local currency debt options.
- **Inflation driving high interest rates** – high inflation rates in many developing countries, often driven by high fuel costs, are maintaining upward pressure on domestic interest rates. This high cost of capital creates a significant burden on power projects which are capex intensive (and thus highly sensitive to the cost of financing). This is a cyclical issue as the resulting cost of electricity must be increased in order to support the high interest rates, which further impacts inflation on manufactured goods or other power-intensive industries.
- **Government subsidization of electricity pricing** – Many developing countries subsidize the price of electricity as well as conventional diesel and petrol fuels to consumers. This has two negative effects for the power sector: first it creates an artificial comparison point for technologies such as solar power, which are perceived to be very expensive. However when solar is compared to unsubsidized levels of conventional electricity it is often a net cost saving technology even today. Second, the electricity subsidies are often borne by the government utilities which then carry huge losses on their balance sheets and a resulting low credit rating. This impacts the ability for projects backed by utility contracts to secure financing as well as their ability to collect payments for electricity sales.

Question 2: What are the top (one to three) sections of the value chain that your firm/industry expects to be the major export area(s)?

- **Solutions for Yield Enhancement of Solar Sites** – while a lot of low hanging fruit has already been captured with regards to cost reduction of solar equipment, there is still much work to be done on improving the amount of electricity that a standard unit of a solar system can generate. There are several areas where the US has a technology leadership position: (1) tracking systems and software: the ability to mechanically pivot the solar plant to track the sun's path each day, and the optimized sun tracking algorithm. (2) Software for monitoring solar plant performance, optimizing performance, and managing preventative maintenance, and (3) micro-electronics at the solar panel level and micro-inverters to more intelligently optimize solar plant performance according to micro-conditions across the power system
- **Project Development Expertise** – Developers are investing heavily to optimize the cost of power generation to expand access to solar technology. This includes innovation across site identification, system design, financing, procurement, and operations/maintenance. This expertise, and the ability to tailor the project development approach to local conditions, will be a critical enabler of the next phase of growth of the solar sector, especially as developing markets become increasingly important.

- **Offgrid Solar Solutions** – The ability to set up a solar system, whether for an industrial offtaker or a rural community and provide reliable power without support from the grid (and to do so cost effectively). This includes the entire package including solar modules, battery storage, power controllers and diesel genset integration.

Question 3: What are the top two or three countries/regions that your company/industry expects to be exporting to in the next few years?

- **India** – Since 2008, India has installed over 1.2GW of solar capacity and has the potential to install over 50GW in the next 20 years to support the crippling power deficits the country faces. India does not have domestic fuel resources in sufficient supply to power the growth of the electricity sector, a factor which is already causing significant inflation in power costs due to imported coal supplies. Solar power is the primary source of power which can be used to generate reliable power in the next 10 years in significant capacity without exposure to global fuel costs.
- **African Continent** – South Africa has been the largest solar market in Africa to-date, but many countries are waking up to the potential to undertake a meaningful solar implementation program. In many African countries, the reliance on hydropower generation has resulted in very low power costs but also tremendous instability in the power infrastructure due to frequent droughts. Solar is already significantly cheaper than the diesel alternative. Finding sufficient affordable financing will be the challenge to increase the access to solar power in Africa.
- **Middle East** – The Middle East region is realizing that the current pace of growth creates a highly unsustainable domestic consumption pattern with regards to oil and gas. UAE has already undertaken some meaningful solar initiatives and Saudi Arabia looks to be the next major global solar market. Smaller countries like Kuwait and Oman are determining the appropriate path to take but will likely follow the lead of their larger neighbors.

Question 4: What are the top two or three policies needed for the US government to support your export plans?

- **Export of US Legal and Regulatory expertise to help international countries create robust regulatory frameworks** for the development of renewable energy projects ; assist in providing inputs for creation of viable feed in tariffs using international benchmarks ; universally accredited legal agreements such as PPA's etc that have balanced risk sharing for lenders and developers and are acceptable to US banks and lending institutions.
- **Providing sovereign insurance to mitigate the credit risk of utilities** in the developing world who are currently unbankable by international financiers for long-term power purchase agreements
- **Continuing to push for open markets for international trade of solar technology.** Countries like India are still pushing for trade barriers to promote an uncompetitive domestic manufacturing industry (and other large markets like Saudi will likely follow a similar model). The US has been a strong supporter of free trade in the solar industry to-date and continued pressure will be required to ensure that these markets remain open for top tier technology to be imported to support large scale solar implementation programs.

Co-Chairman & Director
Astonfield Renewables

Four Questions for the May 1 RE&EE Advisory Committee Discussion:

Jim Crouse

Capstone Turbine Corporation

Question 1: What are the top two or three macro conditions impacting your company/industry today?

- a. Policy framework - support for and regulation of bioenergy powered onsite generation
- b. Customer knowledge of technology and applications for bioenergy powered onsite generation
- c. Available energy infrastructure for grid-tied bioenergy powered onsite generation

Question 2: What are the top (one to three) sections of the value chain that your firm/industry expects to be the major export area(s)?

Question 3: What are the top two or three countries/regions that your company/industry expects to be exporting to in the next few years?

- a. Europe/Russia
- b. Latin America
- c. Asia/Oceania

Question 4: What are the top two or three policies needed for the US government to support your export plans?

- a. DOC/ITA/MAS/OEEI coverage of CHP technologies - including bioenergy-powered
- b. ExIm/OPIC buyer finance facility allowing aggregation of export projects

RENEWABLE ENERGY MARKET OUTLOOK QUESTIONNAIRE

From: Joey Neuhoff

Representing: Covanta Energy Corporation

Question 1: What are the top two or three macro conditions impacting your company/industry today?

- (a) Lack of a Federal Energy Policy means project development is limited to least cost alternative
- (b) Low cost natural gas impacting electricity pricing - head-wind for EfW
- (c) Landfills are cheaper to build and operate than EfW, and no policies to divert waste from LF.

Question 2: What are the top (one to three) sections of the value chain (products, services, intellectual property, etc.) that your firm/industry expects to be the major export area(s)?

- (a) Covanta is a full service provider. We design, build, operate and maintain. All parts
- (b) Most critical to EfW is the operations and guarantees to process the waste.
- (c) Export the entire solution and guarantee operations for 20+ years under long-term contract

Question 3: What are the top two or three countries/regions that your company/industry expects to be exporting to in the next few years?

- (a) Canada
- (b) United Kingdom
- (c) Island Nations

Question 4: What are the top two or three policies needed for the US government to support your export plans?

- (a) Free and fair playing field for US goods and services in marketplace
- (b) China - US JVs should be treated on par and not disadvantaged to domestic firms.
- (c) Promote solid waste hierarchy and integrated waste management in US and abroad.

DLZ Corporation

Bruce Bauchmire

Four Questions for the May 1 RE&EE Advisory Committee Discussion:

Question1: What are the top two or three macro conditions impacting your company/industry today?

Countries imposing import duties on equipment

Electrical tariffs, tariffs for renewable energy producing technologies

Low cost of natural gas

Question 2: What are the top (one to three) sections of the value chain that your firm/industry expects to be the major export area(s)?

Finished product

Operating and maintenance services

Question 3: What are the top two or three countries/regions that your company/industry expects to be exporting to in the next few years?

India

Asia

South America

Question 4: What are the top two or three policies needed for the US government to support your export plans?

Assistance in neutralizing countries import duties on equipment

Assist governments in drafting regulations to promote and provide incentives for investment in new, experimental, and alternative energy producing technologies

First Solar

Four Questions for the May 1 RE&EE Advisory Committee Discussion:

Question 1: What are the top two or three macro conditions impacting your company/industry today?

Anemic economic growth, national budgets deficits, low energy cost (especially natural gas).

Question 2: What are the top (one to three) sections of the value chain that your firm/industry expects to be the major export area(s)?

PV modules, O&M

Question 3: What are the top two or three countries/regions that your company/industry expects to be exporting to in the next few years?

Tier 1: Middle East, India, Japan, Australia

Tier 2: Indonesia, Latin America, Europe

Question 4: What are the top two or three policies needed for the US government to support your export plans?

Strong and more flexible ExIm Funding. ExIm leadership is eager but lending officers more cautious.

Continued support on local content. We are being blocked out of participation in markets by local content rules such as those in S. Africa. 60% local content pretty much has the same impact as 100% local content.

Strong advocacy by US embassies, Department of Commerce, State, etc.

Gamesa

Four Questions for the May 1 RE&EE Advisory Committee Discussion:

Question 1: What are the top two or three macro conditions affecting your company/industry today?

1. Excess U.S. manufacturing capacity (13GW) and a surplus of suppliers (23 in 2012- the top 4 represent 80% of market) during a period of shrinking demand..3GW in 2013 and 6-8 GW 2014. Supply chain in jeopardy.
2. Despite the 1 year extension of the PTC, continued policy uncertainty brought about by the lack of a long-term policy, cripples the industries' desire to invest in new manufacturing processes and technology.

Question 2: What are the top (one to three) sections of the value chain that your firm/industry expects to be the major export area(s)?

1. Wind Turbines
2. Wind farm services:
 - a. Development services from site evaluation, environmental, wind resource analysis, financial solutions
 - b. Long-term O&M services
3. Turnkey solutions

Question 3: What are the top two or three countries/regions that your company/industry expects to be exporting to in the next few years?

Central and South America

Asia

Question 4: What are the top two or three policies needed for the US government to support your export plans?

For U.S. manufacturers to be successful in the global market, we need to drive down the cost of energy. The need is for a multi-year (5-6 years, about 2 technology cycles) policy that gives the industry enough time to make the investments needed to drive down the cost of energy to make wind more affordable and competitive against other fuel sources.

GEA

Four Questions for the May 1 RE&EE Advisory Committee Discussion:

Question 1: What are the top two or three macro conditions impacting your company/industry today?

Slow growth of the economy and US industry.

Long lead times for projects versus short lead times for federal incentives.

State laws and regulations that don't value attributes of power.

Question 2: What are the top (one to three) sections of the value chain that your firm/industry expects to be the major export area(s)?

Engineering and Geologic Services/Expertise

Drilling Expertise and Services

Binary Power Equipment

Question 3: What are the top two or three countries/regions that your company/industry expects to be exporting to in the next few years?

Central America

Indonesia and Philippines

East Africa

Question 4: What are the top two or three policies needed for the US government to support your export plans?

One-stop shop for project and financing support

Coordinated support for early industry-government involvement in key countries

US support at international/multilateral agencies and banks

Leeco Steel

Four Questions for the May 1 RE&EE Advisory Committee Discussion:

Question 1: What are the top two or three macro conditions impacting your company/industry today?

- Low natural gas prices
- Unstable policy environment – last minute PTC extensions discourage wind manufacturing companies from making long-term investments in the U.S.
- Local content requirements in potential markets

Question 2: What are the top (one to three) sections of the value chain that your firm/industry expects to be the major export area(s)?

- Wind turbine nacelles – finished product
- Wind turbine blades – finished product

Question 3: What are the top two or three countries/regions that your company/industry expects to be exporting to in the next few years?

- Canada
- Central America (particularly Mexico)
- South America (particularly Brazil, Chile, Uruguay)

Question 4: What are the top two or three policies needed for the US government to support your export plans?

- A more stable policy environment to encourage investment in U.S. wind turbine component manufacturing
- Assistance in eliminating local content requirements in Latin American markets, especially Brazil
- Providing assistance/incentives to help neutralize import duties in potential markets

Mage Solar

Question 1: What are the top two or three macro conditions impacting your company/industry today?

- Market Price erosion and competition from subsidized competitors both foreign and locally.
- General market awareness of solar and negative propaganda about cost and capability. Unfair comparison to other energy sources
- Available end user funding

Question 2: What are the top (one to three) sections of the value chain that your firm/industry expects to be the major export area(s)?

- Finished product

Question 3: What are the top two or three countries/regions that your company/industry expects to be exporting to in the next few years?

- Mexico
- South America

Question 4: What are the top two or three policies needed for the US government to support your export plans?

- Agreements with Brazil and other South American countries to avoid high tariffs on foreign imports from USA

Best regards

Sylvia Minton

Sr. Vice President Corporate, Institutional & Government Affairs

RENEWABLE ENERGY MARKET OUTLOOK QUESTIONNAIRE

From: Ken Kramer

Representing: Rushton Atlantic

Question 1: What are the top two or three macro conditions impacting your company/industry today?

- (a) Gas prices
- (b) Scarcity of tax equity and/or alternative forms of subsidy

Question 2: What are the top (one to three) sections of the value chain (products, services, intellectual property, etc.) that your firm/industry expects to be the major export area(s)?

- (a) wind turbines
- (b) smarty control systems

Question 3: What are the top two or three countries/regions that your company/industry expects to be exporting to in the next few years?

- (a) Europe
- (b) China

Question 4: What are the top two or three policies needed for the US government to support your export plans?

- (a) Growth in US based export financing
- (b) Due diligence requirements for project approvals

RE&EEAC RE Survey
The Stella Group, Ltd.
Scott Sklar, President
April 20, 2013

Question 1: What are the top two or three macro conditions impacting your company/industry today?

- **No long term financing entity for medium/small scale projects or customers** – These countries usually do not have banks servicing these end users, regions or market niches. Need to have some aggregation of small projects into larger financed projects to reduce transaction costs.
- **Government subsidization of electricity and fuel pricing** – Many developing countries subsidize the price of electricity as well as conventional diesel and petrol fuels to consumers.

Question 2: What are the top (one to three) sections of the value chain that your firm/industry expects to be the major export area(s)?

- **Solutions for Optimal Integration of High Value Energy Efficiency and Renewable Energy**
– for industrial. Commercial, institutional, and infrastructure
- **Software Integration Expertise** – Developers are investing heavily to develop new energy diagnostic, load management, and cyber-security protection – and the integration of a myriad of platforms
- **Offgrid Solar Solutions** – The ability to deploy hybrid renewable energy system, whether for an industrial offtaker or a rural community and provide reliable power without support from the grid (and to do so cost effectively). This includes the entire package including solar modules, battery storage, power controllers and diesel genset integration.

Question 3: What are the top two or three countries/regions that your company/industry expects to be exporting to in the next few years?

- **Latin America and The Caribbean** - close by and their economies are booming
- **African Continent** – with a focus first on west Africa (top to bottom) and begin engaging North Africa Arab Spring countries
- **South East Asia** – with a focus towards Sri Lanka, Indonesia, Thailand, Vietnam, and The Philippines – all pro American and whose economies are expanding

Question 4: What are the top two or three policies needed for the US government to support your export plans?

- **Practical technology and finance expertise to help international countries create robust markets** - for the development of renewable energy projects and match
- **Providing financing aggregation service** – focused on the developing world who are currently under-financed by the multilateral banks and international financiers for long-term equipment financing and power purchase agreements
- **Continuing to push for open markets for international trade of efficiency, biofuels, and renewable energy technology.** Free the option for consumers.

Tow Path

Four Questions for the May 1 RE&EE Advisory Committee Discussion:

Question1: What are the top two or three macro conditions impacting your company/industry today?

- Low natural gas prices driving down the profitability of renewable energy and energy efficiency investments in US;
- Low interest rates: good for creating leveraged equity returns, bad for making interest bearing investments;
- Abundance of capital sitting on the side lines, seeking investment opportunities;
- General fear / uncertainty around investment climate for renewables given volatility in supportive policies, at home, and abroad; reductions or termination of feed in tariffs (Western Europe), application of taxes to renewable generators overseas (Czech example); PTC / MLP / REIT uncertainty at home;

Question 2: What are the top (one to three) sections of the value chain that your firm/industry expects to be the major export area(s)?

- I think the US *could* lead in the manufacture and export of software, technology and smart technologies. This includes software enabled hardware that consumes energy more intelligently (hydropoint efficient irrigation; Skyline smart lighting; EVs like Tesla cars and Smith trucks, biotech applications to food, water and fuel.)
- I think the US *will* lead where we have companies that are too big to fail controlling natural resources benefitting from their economies of scale and federal support at the policy level; polysilicon; natural gas (LNG), etc; Focus on this second approach will side step the potential for broad wealth and job creation in lieu of short term profits to large multinationals and will leave innovation and growth to other countries.

Question 3: What are the top two or three countries/regions that your company/industry expects to be exporting to in the next few years?

- We provide financing. We currently focus on US. Have looked outside the US, (Eastern & Western Europe & Carribean) however, complexity and volatility of non-US markets have caused us and our investors to be uninterested in non-US markets. VC investing colleagues have invested in US start-ups and would like to see those companies able to develop markets abroad. Meeting challenges at home is a pre-requisite to commencing export.

Question 4: What are the top two or three policies needed for the US government to support your export plans?

Exports need to be driven by strength at home, not despair at home. Presently, those considering exporting are doing so in search of higher power prices and more favorable government policies. This

will not lead to strong US companies with an export presence, but will lead either to failure or emigration.

Because of this, I think US export policy focus should be directed at strengthening US market:

- Price on carbon (tax, cap and trade)
- National RPS
- More stable and long term tax policy w/ fungible tax credits
- Access to public markets / REITs / MLPs.

Countries with these attributes will provide good markets for REEE goods and services and will be the beneficiaries of the resulting technology innovations and job creation.

Verdant Power

Four Questions for the May 1 RE&EE Advisory Committee Discussion:

Question 1: What are the top two or three macro conditions impacting your company/industry today?

- 1) Funds to match government grants to certify technology for exportation; and
- 2) Funds to support resource assessments and feasibility analysis leading to international commercial project development.

Question 2: What are the top (one to three) sections of the value chain that your firm/industry expects to be the major export area(s)?

- 1) Resource assessment and feasibility analysis/study services
- 2) Modular and readily scalable MHK commercial standard systems that are tailored for sites

Question 3: What are the top two or three countries/regions that your company/industry expects to be exporting to in the next few years?

- 1) Canada, UK, and Ireland
- 2) Turkey
- 3) Africa

Question 4: What are the top two or three policies needed for the US government to support your export plans?

- 1) Identifying potential in-country partners and needs
- 2) Initial pilot project funding support (e.g., feasibility study grants, competitive loans, etc.)