



World Future Energy Summit Bulletin

A Daily Report of the World Future Energy Summit (WFES) 2012

Published by the International Institute for Sustainable Development (IISD) in collaboration with Masdar

iisd Reporting Services

ONLINE AT [HTTP://WWW.IISD.CA/YIMB/ENERGY/WFES/WFES2012/](http://www.iisd.ca/yimb/energy/wfes/wfes2012/) ISSUE #3, VOLUME 187, NUMBER 10, THURSDAY, 19 JANUARY 2012



WORLD FUTURE ENERGY SUMMIT 2012 HIGHLIGHTS: WEDNESDAY, 18 JANUARY 2012

On Wednesday, the World Future Energy Summit (WFES) 2012 was organized around the “Technology & Innovation Forum” theme. In the morning, participants heard a keynote address and panel discussion by technology leaders and entrepreneurs during two plenary sessions. In the afternoon, participants attended parallel sessions on issues including solar technology, energy storage, energy-smart infrastructures, carbon capture and storage (CCS), bioenergy, and nuclear power. Side events also took place in a variety of locations throughout WFES, including the Project Village, the Young Future Energy Leaders pavilion, roundtables, and in pavilions and conference suites.



HH General Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi, visits the booth of the Department of Municipal Affairs, Abu Dhabi

TECHNOLOGY LEADERS IN FUTURE ENERGY - INSIGHTS FROM THE INNOVATORS

In a keynote address, Alex Burns, CEO, Williams Formula One (F1), explained that the entrepreneurial and engineering culture of Williams F1, one of the world’s lead car-racing teams, delivers rapid and evolving solutions to complex technical challenges. He described how the flywheels that Williams F1 is developing for hybrid racing cars are being adapted to improve energy efficiency in public buses, sports cars, and metro trains.

Jason Pontin, Editor-in-Chief, MIT’s Technology Review, chaired the session. Panelists agreed smart grids need to store and deliver high amounts of renewable energy. Jan Mrosik, Siemens, emphasized smart metering and smart response. Kazuo Furukawa, Chairman, New Energy and Industrial Technology Development Organization (NEDO), said

energy storage remains a large gap. Santiago Arias, Torresol, emphasized that energy can be stored and converted according to environmental conditions and demand for electricity. Ben Kortlang, Amonix, described the challenges for clean technologies to be economically viable at a large scale without subsidies. Kathy Pepper, Exxon Mobil, described the potential for producing biofuels from algae. Bill Sims, CEO, Joule Unlimited, said his company’s engineered microorganisms represent a low-cost, fungible, and a modular renewable fuel platform that eliminates biomass needs. Charles Soothill, Alstom Power, explained that a mixed renewable portfolio can address power generation intermittency, and underscored, among others: carbon capture and storage (CCS); transmission grids; and energy efficiency, storage and density. Andrew Beebe, Suntech, proposed the development of a five-year roadmap for eliminating all energy subsidies.

INSIGHTS FROM THE ENTREPRENEURS

Moderator Chris Hartshorn, Lux Research, described the panel’s goal as identifying the benefits and challenges for entrepreneurs in the clean technology sphere.

Noting that favorable government policies are key for clean technology entrepreneurship to thrive, Eric McAfee, Chairman and CEO, Aemetis, called for strong regulatory frameworks to enable entrepreneurs to make short-term technology development commitments, as well as long-term financial commitments.

Jennifer Holmgren, CEO, LanzaTech, spoke on innovation to create a new energy future, explaining the importance of entrepreneurial companies in furthering clean technologies globally. She described her company’s work in gas fermentation.



Alex Burns, CEO, Williams Formula One (F1)

The *World Future Energy Summit Bulletin* is a publication of the International Institute for Sustainable Development (IISD) <info@iisd.ca>, publishers of the *Earth Negotiations Bulletin* © <enb@iisd.org>. This issue was written and edited by Catherine Benson, Tallash Kantai, Jonathan Manley, Miquel Muñoz, Ph.D., Delia Paul and Ari Daniel Shapiro, Ph.D. The Photographer is Diego Noguera. The Digital Editor is Brad Vincelette. The Editor is Leonie Gordon <leonie@iisd.org>. The Director of IISD Reporting Services is Langston James “Kimo” Goree VI <kimo@iisd.org>. Funding for coverage of this meeting has been provided by Masdar. IISD can be contacted at 161 Portage Avenue East, 6th Floor, Winnipeg, Manitoba R3B 0Y4, Canada; tel: +1-204-958-7700; fax: +1-204-958-7710. The opinions expressed in the *Bulletin* are those of the authors and do not necessarily reflect the views of IISD. Excerpts from the *Bulletin* may be used in other publications with appropriate academic citation. Electronic versions of the *Bulletin* are sent to e-mail distribution lists (in HTML and PDF format) and can be found on the Linkages WWW-server at <http://www.iisd.ca/>. For information on the *Bulletin*, including requests to provide reporting services, contact the Director of IISD Reporting Services at <kimo@iisd.org>, +1-646-536-7556 or 300 East 56th St., 11D, New York, New York 10022, United States of America. The IISD team at WFES 2012 can be contacted by e-mail at <miquel@iisd.org>.



<http://wfes.iisd.mobi/>

Stressing that clean energy is the greatest entrepreneurial opportunity of this generation, Steve Crane, CEO, LightSail Energy, welcomed non-traditional funding sources to provide capital to start-ups and entrepreneurs. He noted that numerous regulatory issues are obstacles to introducing renewables.

Christine Gulbranson, Symphony Equity Partners, described the energy innovation cycle, highlighting potential “valleys of death” in both technological development and commercialization phases, before moving into maturity and price competitiveness.



Christine Gulbranson,
Symphony Equity Partners,
US

In the ensuing discussion, participants considered, among others, the: advantages of start-ups in managing early-stage innovation; capital-intensive nature of energy companies; influence of the regulatory environment; need to offer energy products that will help companies expand their markets; and value of an “accelerator”

approach enabling start-ups to access networks and strategic partnerships.

INNOVATION IN SOLAR TECHNOLOGIES

This parallel session, moderated by Eicke Weber, Chairman, Fraunhofer Institute, shed light on new and emerging technologies and financial innovations in the solar energy system.

Highlighting China’s strength in the solar market as manufacturing cost-effective, affordable solar panels, Haiyun Sun, Trina Solar, explained that for innovation in solar technology to be successful, technology, business, and open mindsets must be considered simultaneously. Robert Seiter, Ernst & Young, noted that the solar technologies currently drawing the highest levels of investment are concentrated solar power (CSP), copper indium gallium (di)selenide (CIGS), and concentrated photovoltaics (CPV). David Egelsham, First Solar, highlighted drivers for high photovoltaics (PV) penetration in the energy mix, including longer-term strategic partnerships between suppliers and grid operators, and plant energy output that is predictable, controllable, and “smooth-ramping.”

Adrian Wood, Siemens, pointed out the challenges of getting the energy mix “right,” including the complexity of PV, CPV, and CSP systems, their costs, and the capacity of existing grids. He expressed his company’s commitment to meeting the universal energy access for all targets. Comparing the conditions for PV-uptake in the US, Germany and Saudi Arabia, Rhone Resch, President and CEO, US Solar Energy



Jennifer Holmgren,
CEO, LanzaTech, New
Zealand

Industries Association, urged countries in the Middle East to tap into solar energy on a larger scale because the cost of the technologies is decreasing.

Calling for a new business model for solar power, Simon Bransfield-Garth, CEO, Eight19, described the IndiGo Pay-As-You-Go Solar Initiative, which merges mobile phone and solar technology to create low-cost energy solutions for populations in East Africa. Paul von Son, CEO, Desertec, described three phases to link renewable energy production in the deserts of North Africa and the Middle East to European markets in the next 25 years. Matteo Codazzi, CESI, presented on high CPV technology, noting its suitability for Africa, Latin America and parts of Asia.

Sami Khoreibi, CEO, Environmena, informed participants that many countries in the Middle East are committed to a 7% or higher renewable energy target, including PV. Speaking on the future of PV and CSP, Daniel Calderon, Masdar Power, emphasized that PV has the capacity to “solve people’s problems” in several locations around the world at lower costs than current alternatives.

WHAT’S NEXT FOR CARBON CAPTURE AND STORAGE?

Simon-Pierre Monette, Booz and Company, moderated the panel. Panelists discussed education, knowledge transfer, projects, and technology related to CCS.

Liz Stubholt, CEO, Aker Clean Carbon, said carbon capture will remain an available, feasible, and viable option for decades to come. John Barry, Shell, highlighted three challenges of CCS demonstration projects: financing, public acceptance, and high costs. He noted that a small number of projects are in execution. Bernd Holling, Linde Group, described three technologies for scaling up CCS pilot projects to demonstration projects, related to the fuel, pre-commercial, and post-commercial stages.

Badar Al Lakmi, Director, Masdar Carbon, noted the potential of CCS to qualify for funding under the Clean Development Mechanism as an incentive to continue pursuing CCS technologies as a mechanism for carbon reduction. Saif Al Sayari, Abu Dhabi National Energy Company, described CCS as an important avenue for mitigating fossil fuel contributions to global warming.

Panelists discussed the need for greater education on CCS, noting that the public lacks understanding of the technology. Holling described public resistance to onshore storage. He said collaboration with academia could boost public opinion. Lakmi proposed joint education efforts between governments and project developers.

ENERGY STORAGE – TECHNICAL CHALLENGES: MARKET OPPORTUNITIES

Jurgen Weiss, Brattle Group, moderated the session. He explained that pumped hydropower dominates overall energy storage capacity, while battery storage technology still accounts



Panel on Innovation in Solar Technologies



Panel on Energy Storage

for a small portion. Timothy Patey, ABB, said energy storage provides more control for electric grids. He described using energy storage systems to complement fixed electricity infrastructure, and emphasized matching storage technologies with applications. Jarl Pedersen, Xtreme Power, presented a lead acid battery technology that is highly efficient and 98% recyclable. He noted projects in Hawaii where battery storage technology has been used successfully to stabilize integration of wind and solar generation into the grid.

Tom Zhao, BYD, said China's renewable electricity generation targets provide a fertile market for storage technologies. He said his company's battery technology is produced inexpensively and can be used in both small and large-scale applications. Alex Katon, International Power-GDF Suez, highlighted that significant storage technology will be required to stabilize 18,000 MW of renewable energy capacity in the region by 2020. He noted that barriers to renewable energy also limit energy storage system uptake.

In the discussion, participants discussed energy storage versus fossil fuel generation, and that innovation to improve battery capacity is relatively slow.

THE ROLE OF NUCLEAR ENERGY IN A SUSTAINABLE ENERGY FUTURE

Matt Brown, Pöry Management Consulting, chaired this session, which focused on nuclear potential in the Gulf region.

Ibrahim Babelli, King Abdullah City of Atomic and Renewable Energy, Saudi Arabia, cited future energy demand based on generational demographics, growth in manufacturing and service industries, and a shift away from reliance on fossil fuels. Homam Albaroudi, Gulf Cooperation Council, presented learnings from a joint study on the possibility of shared regional nuclear power development, noting concerns regarding trans-boundary responsibilities.

Mike Waite, Westinghouse Electric Company, highlighted increased interest in "passive" response systems to increase plant safety; for example, through utilizing gravity-fed water cooling systems. Ahmed Ateeq bin Rubea Al Mazrouei,

Emirates Nuclear Energy Corporation, noted the lessons of the Fukushima disaster were being incorporated into current designs for nuclear power plants.

In the ensuing discussion with the audience, panelists discussed issues such as: overseas sources of enriched uranium; security of supply; waste disposal; and capital investment. Babelli concluded that nuclear development in the Gulf region will require application of international best practice, preparation of physical and human resources, and close international cooperation.

BIOENERGY: BIOMASS FOR POWER GENERATION

Ausilio Bauen, E4Tech, moderated the parallel session. Anselm Eisentraut, International Energy Agency, noted bioenergy supplies about 10% of the world's primary energy demand, but it is generally used inefficiently. He said biomass will potentially play a large part in curbing future greenhouse gas emissions in ambitious mitigation scenarios. Bart Dehue, Vattenfall, described that his utility is substituting coal with biomass chips for combined heat and power generation. He said biomass is an ideal CO₂ reduction strategy as many coal-fired power stations can be modified to use woodchips in addition to coal. Ralph Sims, Massey University, referenced the IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation, noting its relevance to WFES discussions. He said that biomass with CCS may be an important mitigation option in the future.

Olivier Dubois, UN Food and Agriculture Organisation (FAO), spoke on bioenergy and food security criteria and indicators developed by FAO and United Nations Environment Programme to support government knowledge and policy. He said that biofuels are "neither good, nor bad, what matters is the way they are managed." Raffi Balian, US Department of State, underlined the US commitment to universal energy access. He noted that the US is the largest producer of bioenergy, which, he said, is an important component for diversifying energy supply.



Panel on the Role of Nuclear Energy in a Sustainable Energy Future

DIGITAL ENERGY: SMART INFRASTRUCTURE

Chaired by José Alberich and Jörg Schrottke, A.T. Kearney, this session focused on the role of smart grids and infrastructure in optimizing energy efficiency and consumption. Edward Abbo, President, C3, defined digital energy as the cyber-infrastructure used to gather, interpret, and utilize data along the supply chain to improve utility-customer interactions. He also described C3's collaboration with Masdar City, calling it a "live experiment of the smart grid." Eyad Alqadi, Cisco Systems, presented the multi-tiered security preventions that must be taken against cyber-attacks aimed at crippling energy infrastructure and causing blackouts. He added that smart infrastructure can help traditional and renewable energy sectors. Sjaak Antheunisse, Alcatel-Lucent, commented on the challenge of engaging the end customer in a new age of responsible energy consumption, and said infrastructure solutions must come from many players. Gianluca Marini, CESI, stressed the importance of incentivizing customers to switch their energy consumption from peak to off-peak demand load, and described the role of transmission system operators in managing power flows. Stephan Singer, WWF, said that investment and policy are required to encourage and sustain a decentralized and distributed smart grid. The panelists were optimistic about the future of renewables and smart infrastructure.

NETWORKING VISITING EXHIBITION

Delegates were offered the opportunity to tour the World Future Energy Summit exhibition late Wednesday afternoon, viewing the offerings of several hundred exhibitors who filled the venue space with booths, working models, video displays, and giveaway items.

Models of electric cars, including one currently being tested at Masdar City, drew a steady stream of interest. One version offered participants the opportunity to "drive" using a video-monitor racetrack, part of an educational display on smart transportation.

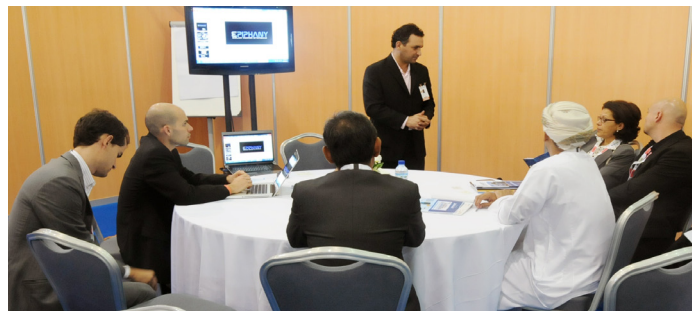
Other eye-catching installations included the wind turbine rotating high above the IRENA booth, a water sprinkler system displaying lighting and logo effects, and an oil corporation's demonstration of carbon capture and storage using Lego blocks.

Technology went hand-in-hand with human resource development as students and young people thronged the lecture spaces and special events, including participants in Masdar's Young Future Energy Leaders initiative.

While the focus at WFES was on technological innovation, many government agencies ran pavilions promoting investment opportunities and country products, from solar panels to carbon markets and coastal monitoring. Conference and specialized publishing industry representatives also worked the hallways, offering information on and overviews of the renewables market through publications and organized events.

SIDE EVENTS

In addition to the plenary and parallel sessions, delegates attended numerous events throughout WFES, including: roundtable discussions; the Project Village; discussions at the



Roundtable on Solar Powered Water Desalination

Young Future Energy Leaders pavilion; displays at Innovate@WFES; presentations at the Masdar theater; and other side events, meetings, and workshops at national, institutional, and company pavilions. These included:

INTELLIGENCE IN FUTURE ENERGY SYSTEMS:

During a morning side event, Ulrich Eberl, Siemens presented a vision of an urban energy system resembling the Internet, connecting smart energy-producing and consuming devices. He said exponential increases in computing will result in more smart devices and applications for device interactions, and optimized consumer lifestyles.

SOLAR POWERED WATER DESALINATION:

During an early afternoon roundtable, Tom Joseph, President, Epiphany Solar Water Systems, described his company's use of concentrated solar energy to power seawater desalination and purification through flash distillation. He said it is safe, scalable, affordable, and accessible, and their target markets include NGOs and local micro-entrepreneurs in the developing world, governments, and municipal plants.

CARBON CONSCIOUS CORPORATIONS: During an afternoon side event, Vestas presented WindMade, a certification scheme for organizations that produce a minimum of 25% of their energy from renewable sources. He said Vestas had invested half their winnings from the 2011 Zayed Future Energy Prize into developing WindMade. He noted that Bloomberg New Energy Finance, Lego, Method, Motorola, and others are also working towards certification.

SUMMARY

A summary of WFES will be available online for free download on Sunday, 22 January at <http://www.iisd.ca/ymb/energy/wfes/wfes2012/>



"Driving" on a virtual racetrack to learn about smart transportation

