RENEWABLE ENERGY & ENERGY EFFICIENCY FY’14 BUDGET

Scott Sklar
President, The Stella Group, Ltd.
on
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Washington, DC
The Stella Group, Ltd. is a strategic technology optimization and policy firm for clean distributed energy users and companies which include advanced batteries and controls, energy efficiency, fuel cells, geoexchange, heat engines, microhydropower (including tidal and wave), modular biomass, photovoltaics, small wind, and solar thermal (including CSP, daylighting, water heating, industrial preheat, building air-conditioning, and electric power generation). The Stella Group, Ltd. blends distributed energy technologies, aggregates financing with a focus on system standardization. Scott Sklar serves as Steering Committee Chair of the Sustainable Energy Coalition, composed of the renewable and energy efficiency associations and analytical groups, and sits on the national Boards of Directors of the non-profit Business Council for Sustainable Energy and The Solar Foundation, teaches two unique interdisciplinary sustainable energy courses at The George Washington University and appointed onto the US Department of Commerce (DOC) RE/EE Advisory Committee.

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“About a quarter of what is in your car’s gas tank is highly toxic. Thus, your exhaust, and that of others, contributes substantially every day both to unacceptable cancer risks for those people who breathe it and to tens of thousands of premature deaths from cardiopulmonary complications.”

Former CIA Director James Woolsey has tried to call attention to the link between America's addiction to foreign oil and terrorism. He has repeatedly said U.S. taxpayers were paying for "both sides" in the war on terror, American soldiers on one end and the terrorists who receive support from oil-rich nations on the other.
Thermoelectric power accounts for about half of total water withdrawals. About 52 percent of fresh surface-water withdrawals and about 96 percent of saline-water withdrawals are for thermoelectric-power use.

Irrigation accounts for about a third of water use and is currently the 2nd largest use of fresh water in the United States.
In 2011, global atmospheric levels of CO2 reached a high of 391.3 parts per million (ppm), up from 388.6 ppm in 2010 and 280 ppm in pre-industrial times. According to new research conducted by the Worldwatch Institute.

More than 70 percent of CO2 emissions result from the burning of fossil fuels for energy use, such as electricity generation, transportation, manufacturing, and construction. In 2009, electricity generation and heating alone accounted for 41 percent of all energy related CO2 emissions.
figure 30: energy resources of the world

source: WBGU

Institute DLR, Institute of Technical Thermodynamics, Department of Systems Analysis and Technology Assessment, Stuttgart, Germany
Ecofys BV, P.O. Box 8408, NL-3503 RK Utrecht, Kanaalweg 16-G
Percentage of Clean Energy in 21st Century

- 20% Wind Energy
- 15% Solar-Distributed PV/ST
- 15% Solar-Concentrated Solar
- 10% Water Energy
- 10% Geothermal
- 12% Building RE: GCHP/SD
- 8% Waste Heat
- 15% Biomass Power
- 20% Wood Energy
32 States can be Self-Sufficient
Global subsidies for fossil fuel consumption are set to reach $660 billion in 2020, or 0.7 percent of global gross domestic product, unless reforms are passed to effectively eliminate this form of state aid, according to the International Energy Agency. The IEA estimated such subsidies at $409 billion in 2010, compared to $312 billion in 2009. Oil products had the largest subsidies at $193 billion in 2010 while $91 billion went to natural gas. Iran and Saudi Arabia had the biggest subsidies. Leaders of the Group of 20 major economies committed in Pittsburgh in 2009 to phase out, over the medium-term, inefficient fossil fuel subsidies that encourage wasteful consumption. Eliminating fossil fuel consumption subsidies by 2020 would cut global energy demand by 4 percent and considerably reduce carbon emissions growth, the IEA said.
Level the Playing Field: Fossil Fuels Enjoy Permanent Incentives 5x Those of Renewables

![Bar chart showing the comparison between Fossil Fuel, Renewables, and Ethanol incentives.]

- Fossil Fuel: $80,000
- Renewables: $70,000
- Ethanol: $60,000

Incentives:
- Grants and Other Direct Payments
- Deduction for Clean Fuel - biofuels
- Biodiesel Blender Credit
- Alcohol Fuel Blender
- VEETC
- Credit for Clean Fuel Vehicles & Property - biodiesel
- CREDS
- 5-year MACRS
- ITC
- PTC
- Other Fossil Fuel Tax Expenditures
- Amortization of Oil & Gas G&G Costs
- NG Gathering Lines as 7 year Property
- Credit for Clean Fuel Vehicles & Property
- Expensce Mine Safety Equipment
- 64-month Amortization for Pollution Control
- Sulfur Reg.Compliance Incentives for Diesel Refiners
- MACRS NG Distribution Lines
- Special Rules of Mining Reclamation
- Expensce of Liquid Fuel Refineries
- Credit for Clean Coal
- Exception to Passive Loss Limitation
- Deduction of Clean Fuel Vehicles & Refueling Property
- Exclusion of Alternative Fuels from Excise Tax
- Exclusions of Payment to Miners
- Coal Royalty as Capital Gains
- Enhanced Oil Recovery
- Percent Depletion
- Exploration & Development Expensing
- Credit for Nonconventional Fuel
- Foreign Tax Credit
The Union of Concerned Scientists released a February 2011 report about the subsidies for nuclear power. The report, “Nuclear Power: Still Not Viable Without Subsidies,” found that more than 30 subsidies have supported every stage of the nuclear fuel cycle, from uranium mining to long-term waste storage. Added together, these subsidies often have exceeded the average market price of the power produced. The report also examines the subsidies for new reactors.

Executive Summary:

Full Report:
# EERE Budget Summary

<table>
<thead>
<tr>
<th></th>
<th>FY 2012 Current</th>
<th>FY 2013 Request</th>
<th>FY 2013 Annualized CR</th>
<th>FY 2014 Request</th>
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<td>Sustainable Transportation</td>
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<td><strong>Subtotal Energy Efficiency and Renewable Energy</strong></td>
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<td>Use of Prior Year Balances</td>
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<td><strong>Total Energy Efficiency and Renewable Energy</strong></td>
<td><strong>1,780,548</strong></td>
<td><strong>2,267,333</strong></td>
<td><strong>1,820,713</strong></td>
<td><strong>2,775,700</strong></td>
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Low Wind Speed Designs Found To Be Very Attractive, Where They Can Be Deployed

Based on current pricing and assumptions: 100m rotor diameter is found to be economically attractive in comparison to 2012-2013 ‘Standard Technology’ where it can be deployed; a wind sheer higher than $1/7^{th}$ is found to be needed for the 100m tower to be least cost in comparison to the 80m option (with the 100m rotor). The highest wind speed sites evaluated below can support LCOEs as low as \(~\$33/MWh\) (real$), while the lower wind speed sites have LCOEs of \(~\$65/MWh\).
PV System Prices Are Falling Dramatically

Average Installed Price of PV

Source: SEIA/GTM Research Solar Market Insight, "2011 Year In Review"
U.S. Tidal Energy Project (New York, NY)
Company Seeks Matching Funds

Introduction
Verdant Power is interested in providing select potential investors the opportunity to invest in a U.S.-based producer and
developer of marine renewable energy
– Verdant Power established in 2000, headquartered in New York, NY, with subsidiaries in Canada, UK, and Hong Kong
– Leading technology provider and project developer within the marine renewable energy space, utilizing proven proprietary system (Gen5) to generate commercially viable energy
– Expertise in marine energy systems, water resource assessment, site analysis and development, project design, and project operations and maintenance
– Commercial pilot project being developed in New York supported by funding from various public and private institutions

Highlights
– Poised to receive first-ever commercial license for tidal power generation in U.S.

Proprietary Technology
– Generates clean energy from the currents of tides, rivers and large canals
– Energy resources are predictable and underwater placement eliminates view shed disruption
– Simple, scalable design maximizes siting potential (deep offshore, urban, village) and differentiates Company from competitors
– Gen4 turbine proven in an array (world first), supplying power to New York City customers
– Commercial class Gen5 system developed in partnership with U.S. Dept of Energy and U.S. and Canadian national labs

Public and Private Support
– Successful development and operational results have secured funding from governmental partners including U.S. Department of Energy, U.S. Navy, New York State, as well as Sustainable Development Technology Canada and Ontario Ministry of Research & Innovation
– MOUs in place, with eventual aim of developing commercial power farms with various leading public and private entities in North America, Europe, and Asia

Compelling Competitive Position
– Significant development lead over competitors within the marine renewable energy space

Market
Global tidal potential estimated at 60,000 MW (Red areas = prime tidal sites; Blue = good)
DOE EE/RE MARINE ENERGY RD&D

• Request - DOE Waterpower RD&D Program -- $55million.

• Last Year’s Request - This compares to $20 million requested last year.

• FY’13 current funding level is $59million.
WHAT’S MISSING #1

- INTEGRATION WITHIN EE/RE –
  - Storage – advanced batteries, thermal salts, compressed a/w/o, hydrogen, pumped hydropower, etc
  - Buildings – advanced efficiency with renewables (LED, electrochromic glass gchp, pv, small wind, fuel cells, etc.)
Operational **PowerCube™**
New Castle, PA

Participating in the Regulation Market with PJM*

*PJM is the world’s largest competitive wholesale electricity market

Grid Connected

Wind Capable

Solar Capable

Operational **PowerCube™** Commissioned at
Axion Power’s Battery Manufacturing Plant

EV Charging Powered by a 30kW Grid-Tied Solar Array
WHAT’S MISSING #2

• Advanced communication protocols between technologies that meet new cyber-security requirements
• Blending above with smart grid, zero energy buildings, and continuity of operations within buildings, infrastructure, and our energy grids – both wires and pipelines
Lowest Watt Lights: Low Energy Out, Better Lumens Out

18 watts dimmable
cold cathode cfl 72 watt output

LED dimmable
flood 60 watt output
Camp Pendleton Marine Corp Base

**Award:** 2008 SDG@E Large Sustainable Communities Champion

**Daylight Inside’s Contribution:** Designed, manufactured and installed passive daylighting Light Harvest Fixtures in 43 buildings

**Results:** Average 75 fc for 8 hours per day, reduction of kWh usage, safer working environment

**Annual Savings:** Estimated $238,000

**Referral:** “MCB Camp Pendleton is including daylighting installations in future modernization projects and would recommend the services of Daylight Inside.”

Jeff Allen, Energy Manager, Camp Pendleton, USMC

www.daylightinside.com
WHAT’S MISSING #3

• Resource assessment and data mining moved to industry

• Greater interaction with small business to move program from government-initiated to business-initiated

• Align with US homeland security goals & functions
Solar Energy Siting Software

www.solar-red.net
PV Streetlights

- Sturdy – able to withstand hurricane winds and provide needed lighting when the electricity grid is down.

Dade County
Florida USA
Good planets are hard to find.