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Smart Grid

Domestic and International Policies, Priorities, and Programs:

Opportunities for U.S. Industry and SMEs

MBITA Global Smart Energy Conference

November 13, 2009

Monterey, California

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Office of Energy and Environmental Industries

International Trade Administration

U.S. Department of Commerce



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The electricity we use is carried along a grid of lines and wires that dates back to Thomas Edison—a grid that can't support the demands of clean energy. This means we are using 19th and 20th century technologies to battle 21st century problems like climate change and energy security....The investment we are making today will create a newer, smarter electric grid that will allow for the broader use of alternative energy.

President Obama, February 17, 2009, Announcing \$4.5 billion for smart grid projects under the American Recovery and Reinvestment Act (ARRA)



President Obama, October 27, 2009, at the DeSoto Next Generation Solar Energy Center, Announcing the Smart Grid Investment Grant Awards



Key Smart Grid Issues:

- The definition of smart grid depends on 1) the country, and 2) government/industry priorities and policies.
- The smart grid is a cohesive system which combines
 - 1) Information and communication technologies;
 - 2) Electricity generation;
 - 3) Transmission and distribution; and
 - 4) End-use products.
- The United States has taken an all-encompassing approach to smart grid development and deployment, highlighting a two-way flow of electricity and information to/from power plants, customers, equipment, appliances, and vehicles.
- Consumers and industries will have a greater role in their energy management.



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Why Develop a Smart Grid System?

- The reasons vary among countries:
 - 1) Aging infrastructure;
 - 2) Non-existent infrastructure;
 - 3) Clean energy/renewable energy policies; and
 - 4) Socio-economic considerations.



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Estimated Costs of a Modernized Grid System in the U.S.

- **KEMA: \$63 billion (AMI deployment)**
- **EEI: \$65 billion over 10-20 years (utilities and federal government)**
- **EPRI: \$165 billion over next two decades; \$8 billion per year**
- **The Brattle Group: \$1.5 trillion through 2030**

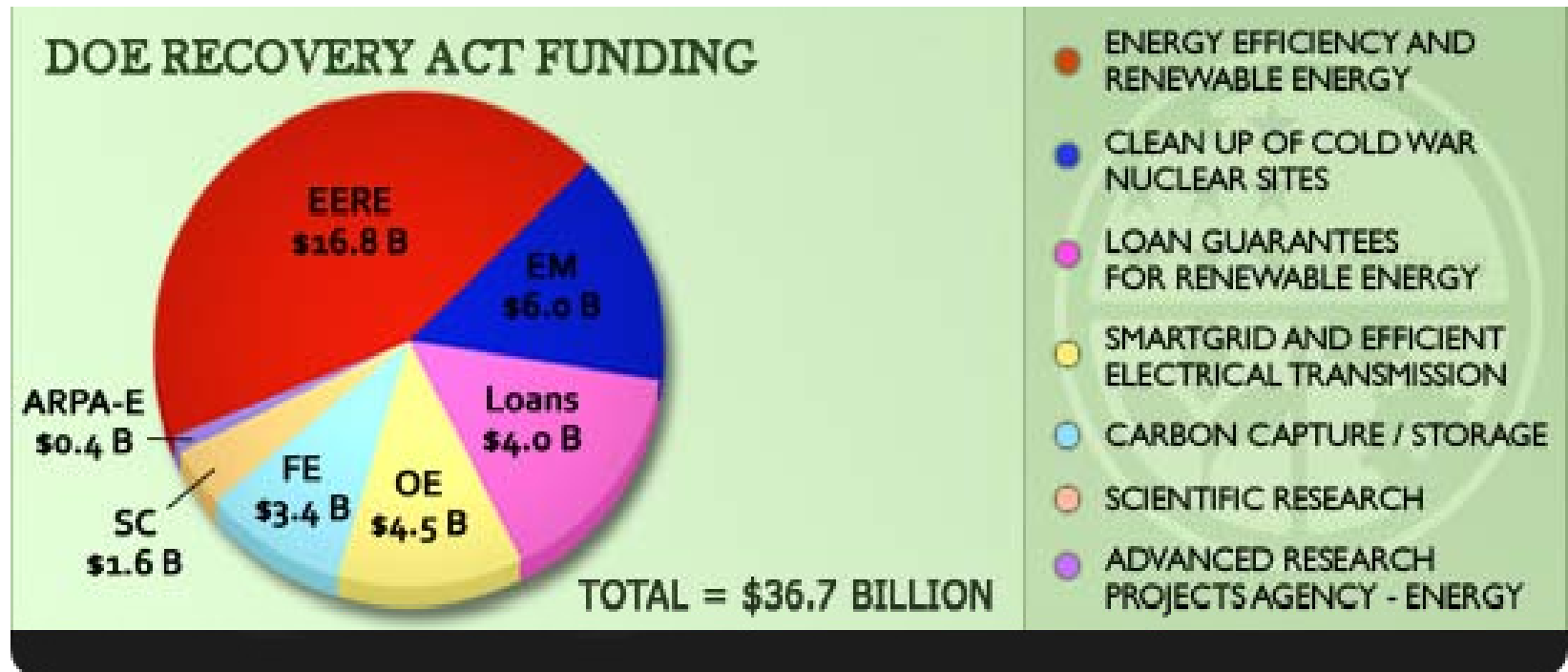


Estimated Benefits of a Modernized Grid System in the U.S.

- **DOE:**
 - \$46-\$117 billion by 2023
- **EPRI:**
 - \$100 billion savings per year in averting potential lost business/grid damages
- **IBM:**
 - Save 10% on power bills
 - Cut power use by 15%
 - Save \$70 billion and \$120 billion on new power plants and transmission lines
- **KEMA:**
 - 280,000 new jobs created over next four years



Clean Energy Programs Under ARRA



Source: U.S. Department of Energy



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Smart Grid Development and Deployment in the U.S.

- Energy Policies
 - EISA 2007
 - ARRA 2009
 - Investment Grants, \$3.4 billion
 - Demonstration Grants, \$615 million
 - Broadband Deployment, \$7 billion
 - Interoperability Standards, \$10 million
- Government Agencies
- Matching Funds
- ARRA Smart Grid Funding will spur additional investments, innovation, green jobs
- Domestic programs are gaining international recognition
- Power generation to end-user





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Recent ARRA Clean Energy Awards Announcements

- **Smart Grid Investment Grants, \$3.4 billion, October 27, 2009**
- **Award to X Prize Foundation, \$5.5 million, November 2, 2009**
- **Industrial Energy Efficiency Projects, \$155 million, November 3, 2009**
- **Energy Efficiency and Conservation Projects, \$38 million, November 3, 2009**
- **Hydroelectric Facility Modernization Project, \$30.6 million, November 4, 2009**



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DOC Smart Grid Programs

- International Trade Administration (ITA)
- National Institute of Standards and Technology (NIST)
- National Telecommunications and Information Administration (NTIA)



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ITA - Market Development Cooperator Program Awards October 2009



2009 MDCP Awards Ceremony

- ITA's MDCP Awards:
 - A public-private partnership to promote the competitiveness of U.S. manufacturing and services firms
 - Coordinated annually by ITA
 - Three-year time frame for projects
- 2009 MDCP Awards:
 - Three of five awards focus on clean technology/clean energy
 - NEMA MDCP Award:
Development of a Secure, Robust, and Reliable North American Smart Electrical Grid



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International Smart Grid Policies, Priorities, and Programs

Australia

Policy Drivers:

- National Energy Efficiency Initiative, May 2009

Grid Priorities:

- Grid reliability
- Environment; CO2 reduction
- Customer empowerment

Pilot Programs:

- Smart Grid, Smart City Initiative, May 2009
- \$100 million investment

Foreign Investment:

- SP AusNet, October 2009



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International Smart Grid Policies, Priorities, and Programs

Brazil

Policy Drivers:

- Central America Electrical Interconnection System
- Regional Infrastructure Integration in South America

Grid Priorities:

- Increase T&D infrastructure
- Ensure bill collection; Reduce electricity theft/meter tampering
- Limit excessive regulation

Pilot Programs:

- Smart meter installation project

Foreign Investment:

- 200,000 new smart meters by end of 2009



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International Smart Grid Policies, Priorities, and Programs

China

Policy Drivers:

- China's Smart Grid Plan, May 2009

Grid Priorities:

- Electricity transmission (UHVDC and UHVAC) to cities
- Industrial growth
- T&D investments now exceed power generation investments

Infrastructure Programs:

- West-East Electricity Transfer Project

Foreign Investment:

- Estimated annual investments of \$10 billion for grid infrastructure
- UHV components; Transmission equipment; ICT overlays



International Smart Grid Policies, Priorities, and Programs

European Union

Policy Drivers:

- Energy Policy for Europe, January 2007
- Third Energy Package, August 2009

Grid Priorities:

- Renewable Energy Integration
- Climate Change Mitigation
- Energy Security

Pilot Programs:

- EU Smart Grid Programs, FP6/FP7
- Member State Smart Grid Programs

Stimulus Spending:

- €2.35 billion for gas/electricity interconnections



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International Smart Grid Policies, Priorities, and Programs

India

Policy Drivers:

- Electricity Act of 2003
- 2008 National Action Plan for Climate Change

Grid Priorities:

- Reduce inefficiency and electricity loss/theft
- Upgrade distribution networks

Pilot Programs:

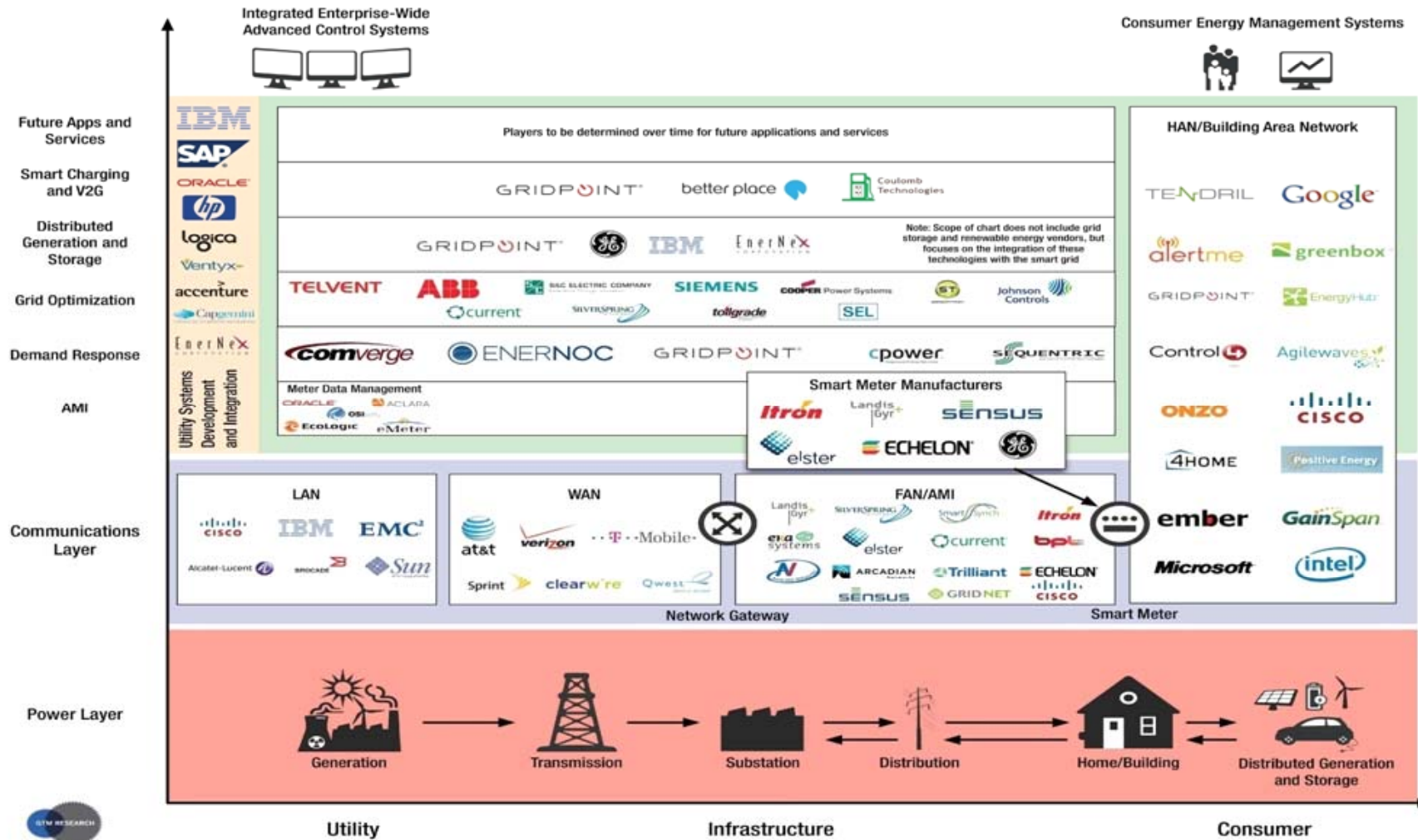
- Microgrid Community, Hyderabad, January 2009

Foreign Investment:

- North Delhi Power Limited, September 2009



"End-to-End" Smart Grid
Leading Players by Market Segment



Source: Greentech Media, The Smart Grid in 2010: Market Segments, Applications, and Industry Players



Growth of Venture Capital in Smart Grid Technologies

<u>Year</u>	<u>VC Funding in Smart Grid Firms</u>
2005	\$60 million
2006	\$281 million
2007	\$419 million
2008	\$461 million
2009 YTD	\$37.5 million+

Source: Greentech Media, The Smart Grid in 2010

- AMI and FAN have received most venture capital
- Smart meter companies have had limited VC investment
- DR to grow substantially in coming years
- Energy storage investments will address intermittency challenges
- Microgrids to expand in developing countries
- HAN market is estimated to grow substantially in coming years



Manufacturing and Services: Competitiveness
Industry expertise focused on improving US competitiveness.

Market Access and Compliance: Barriers
Country expertise focused on removing market access barriers.

International Trade Administration
Creates prosperity by strengthening competitiveness of U.S. industry, promoting trade and investment, and ensuring fair trade and compliance with trade laws and agreements.

Import Administration: Enforcement
AD and CVD expertise focused on identifying and resolving unfair trade practices.

U.S. & Foreign Commercial Service: Promotion
Commercial diplomacy expertise focused on broadening and deepening the U.S. exporter base.

ITA - Working Together to Ensure the Success of U.S. Companies at Home and Around the Globe



Manufacturing and Services

Helps U.S Firms remain competitive by:

- Advocating on policies that assist U.S. manufacturers and service industries to compete abroad
- Working to reduce the costs of policies and regulations on U.S. industries
- Ensuring industry's voice is reflected through President's Export Council, Manufacturing Council, Environmental Technologies Trade Advisory Committee, and Industry Trade Advisory Committees
- Advocating for the interests of the manufacturing and service sectors on standards issues
- Providing critical economic and policy analyses and information to promote business competitiveness

<u>Manufacturing:</u>	<u>Services:</u>
Office of Energy and Environmental Industries	Office of Finance
Office of Materials Industries	Office of Service Industries
Office of Technology and E-Commerce	Office of Travel and Tourism
Office of Health and Consumer Goods	
Office of Transportation and Machinery	



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Office of Energy and Environmental Industries: Advancing Clean Energy and Environmental Technology Exports

Sector Specialization:

- **Air Pollution Control Equipment**
- **Biofuels**
- **Climate Change**
- **Clean Coal Technologies**
- **Transmission, Distribution, and Smart Grid**
- **Energy Efficiency**
- **Gas**
- **Instrumentation and Monitoring Equipment**
- **Nuclear**
- **Oil**
- **Renewable Energy**
- **Water**
- **Waste**



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Office of Energy and Environmental Industries: **Advancing Clean Energy and Environmental Technology Exports**

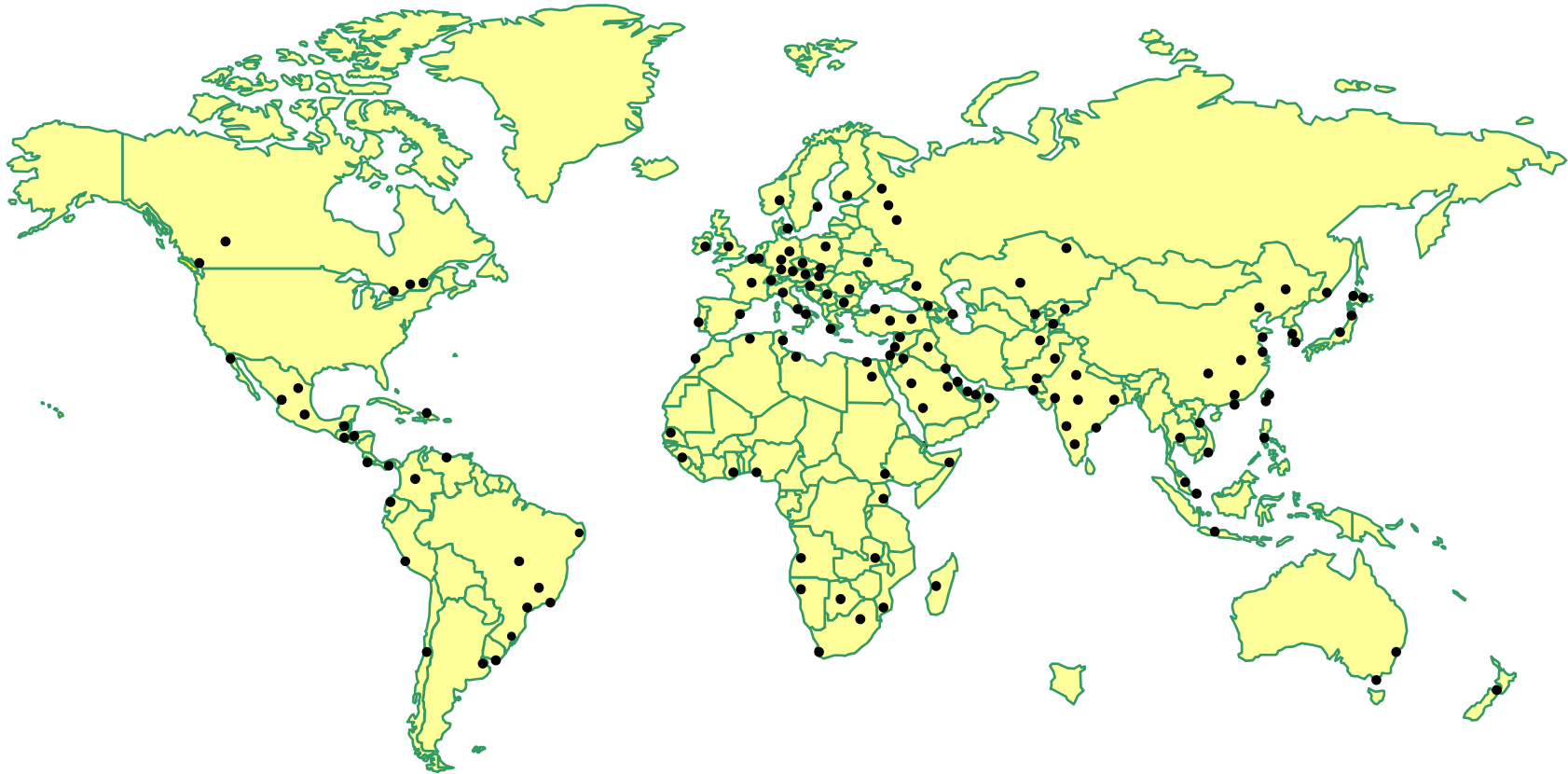
- Energy Efficiency Initiative
 - Energy Efficiency Road Show
 - Energy for Manufacturing Roundtable
 - Domestic/International Smart Grid Program
 - Check List for Corporate Energy Efficiency
- Civil Nuclear Initiative
- Clean Coal Technology Program
- Climate Change and Industry Outreach
- Bilateral, Regional, and Multilateral Activities
- Trade Advisory Committees:
 - 1) Energy, 2) Environmental Technologies





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ITA's Commercial Service Offices Serve U.S. Business Throughout the World





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Commercial Service:

Promoting Exports of U.S. Goods and Services Worldwide

- Located in over 120 U.S. cities and 100 countries worldwide
- Assists U.S. companies in entering new markets
- Provides tailored information to U.S. companies on international buyers, distributors, and agents
- Products and Services:
 - Country and Industry Market Research Reports
 - Gold Key Service (Tailored Business Matchmaking)
 - Trade Counseling and Advocacy
- To find an office near you: www.export.gov



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- Thank You -

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