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Council on  
Competitiveness

American Energy & Manufacturing  
Competitiveness Partnership

# A Summary of Public-Private Partnerships



## PARTNERSHIP POLICY SUMMARY

The following pages provide a summary of 19 public-private partnerships (PPPs) reviewed for the American Energy & Manufacturing Competitiveness Partnership

The listed public policy recommendations have been culled from 28 reports published between 2009 and early 2013 by government agencies, non-governmental organizations, and academic institutions to improve U.S. manufacturing competitiveness, increase energy efficient efforts, and/or spur the development of renewable energy technologies.

Each PPP directly addresses certain public policy recommendations, while other recommendations are intended either to help establish the PPP or to support the mission of the PPP. Please note the PPPs listed in this table may not have a core mission associated with manufacturing (process), energy efficiency (EE), or renewable energy (RE). Nonetheless, these PPPs were studied because the organizational model may be applied to such missions.

## ABOUT THIS DOCUMENT

Each PPP in this infographic has been characterized by its principal purpose as an Early Market, Innovation Network, Mature Market or Test Bed/Demonstration model. The Council notes that while any PPP may be predominantly characterized by one model, it may also have characteristics that fit within multiple models. The summary also suggests a possible application for each PPP's organizational model.

The public policy recommendations are categorized using the "pillars" framework developed by the Advanced Manufacturing Partnership (AMP) Steering Committee for the July 2012 report on advanced manufacturing under the auspices of the President's Council of Advisors on Science and Technology (PCAST). The "Clean Energy Market Risk" category (not in the AMP framework) has been added for purposes of this report.

**Early Market PPPs** tend to focus predominantly on research for technologies that are less established in the market and/or have few mature firms able or willing to support a PPP on their own. Some Early Market PPPs also engage in prototyping and early commercialization activities. Several of the Energy Innovation Hubs fall into this category, working for example on battery technologies, rare earth mineral substitutes or artificial photosynthesis. Industry often partners in such hubs, but tends not to lead them due to the earlier stage of the market or technology.

**Mature Market PPPs** seek to advance the objectives of more mature industries. These PPPs tend to be industry-led and focus on pre-competitive research, cooperative research on advanced manufacturing technologies, or on standards. The technologies addressed by these PPPs can be early-stage or more mature, but there are enough mature companies in the market that the private sector engages heavily in the leadership.

**Test Bed / Demonstration PPPs** focus predominantly on testing and demonstration—often working to establish the market for an emerging technology or group of technologies. Although the other PPP models in this study may include testing and demonstration components, the Test Bed / Demonstration PPPs have testing and demonstration as their primary function. These PPPs are local by nature, even if their user community is national or global in scope.

**Innovation Network PPPs** are generally national or international networks of applied research and demonstration organizations, often focused on a particular technology or set of technologies at each node in the network. The network nodes sometimes are linked by a broad theme, such as advanced manufacturing technologies under the National Network for Manufacturing Innovation or nanotechnology applications under the Interuniversity Microelectronics Centre.


## ICON LEGEND

### Models

 Early Market


 Mature Market


 Test Bed/Demonstration

 Innovation Network


### Possible Applications


 Energy Efficiency

 Renewable Energy

 Manufacturing Process

### Recommendation Pillars

 Enabling Innovation

 Securing the Talent Pipeline

 Improving the Business Climate

 Clean Energy Market Risk

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## PUBLIC-PRIVATE PARTNERSHIPS (PPP)–NATIONAL

**Commonwealth Center for Advanced Manufacturing (CCAM)**

Membership-based applied research consortium developing surface engineering technologies and intelligent manufacturing processes/systems.

**Policies Directly Addressed by the PPP****Policies Indirectly Supporting the PPP****Joint Center for Energy Storage Research (JCESR)**

Research partnership to overcome critical scientific and technical barriers and create new energy storage technology.

**Policies Directly Addressed by the PPP****Policies Indirectly Supporting the PPP****Energy Efficient Buildings Hub (EEB Hub)**

Open consortium accelerating adoption of advanced energy retrofits in commercial buildings by working on design, demonstration and deployment of market proven solutions.

**Policies Directly Addressed by the PPP****Policies Indirectly Supporting the PPP****National Additive Manufacturing Innovation Institute (NAMII)**

Membership-based applied research consortium focused on additive manufacturing innovation.

**National Network for Manufacturing Innovation (NNMI)**

Network of up to 15 tech-focused institutes to create manufacturing research infrastructure for U.S. industry and academia to solve industry-relevant problems.

**Policies Directly Addressed by the PPP****Policies Indirectly Supporting the PPP****Fraunhofer Center for Sustainable Energy Systems (CSE)**

Nonprofit applied R&D laboratory dedicated to the commercialization of clean energy technology.

**Policies Directly Addressed by the PPP****Policies Indirectly Supporting the PPP****National Digital Engineering and Manufacturing Consortium (NDEMC)**

Partnership to demonstrate potential competitiveness impact of high performance computing on small and medium-sized manufacturers.

**Policies Directly Addressed by the PPP****Policies Indirectly Supporting the PPP**

## PUBLIC POLICY RECOMMENDATIONS

**● Enabling Innovation**

**● Demonstration Facilities:** The U.S. government should establish a mechanism for working with the private sector to financially support and implement large-scale energy technology demonstrations, where such demonstrations are essential to enable private sector adoption of clean energy and advanced manufacturing technologies. *Recommended by: Harvard Kennedy School; BI; Brookings; WRI; ITIF; SAFE; Tassej*

**● Innovation Standards:** Industry CEO's and government leaders should elevate and advance U.S. technical standards (a voluntary consensus standards-setting process)—as applicable to drive innovation in clean energy and advanced manufacturing. *Recommended by: CoC; CAP; CNG*

**● Innovation Tax Incentives:** The U.S. government should provide additional incentives for private-sector investments in innovation through tools such as VC capitalization incentives; Production Tax Credits, Investment Tax Credits, and the R&D Tax Credit. *Recommended by: AAM; BI; Third Way; Brookings; ITIF; NSTC; PCAST; CAP; CNG; Harvard Kennedy School; Bloomberg*

**● Public Funding of Pre-Competitive R&D:** The Administration should support annual expenditures on energy and advanced manufacturing R&D. To be effective, this funding must be long-term, stable, and have broad enough bipartisan support to service election cycles. *Recommended by: PCAST; NSTC; Harvard Kennedy School; PCAST; AEIC; BI; Brookings; WRI; CoC; ESLC; AEI*

**● Public Private Partnerships (PPP):** Create and support national and regional public-private, government-industry-academic partnerships to accelerate investment in and deployment of advanced manufacturing, renewable energy, and energy efficiency technologies. *Recommended by: NSTC; BI; Third Way; Brookings; CoC; CAP; CNG; AAM*

**● Technology Development Finance:** Foster a continuum of enhanced capital access for clean energy and advanced manufacturing technologies from start up to scale up. Examples include government managed VC funds the creation of a Green Bank or a Clean Energy Deployment Administration, grants, and loan guarantees. *Recommended by: Bloomberg; CoC; AWEA; BGA; United Steelworkers; PCAST; BI; CAP; CNG*

**▲ Securing the Talent Pipeline**

**▲ Talent–Broadly Defined:** Talent is labeled as broadly defined when the PPP studied lists talent as a core component of its mission, however, does not identify its breakdown of talent-specific activities.

**▲ Talent–K-12:** Federal programs in cooperation with state and local partners should target K-12 students to proactively develop the next-generation of workers. *Recommended by: NSTC; BI; TW; AEI; Brookings; WRI; PCAS; ASE*

**▲ Talent–On the Job:** Provide incentives for companies to make on-the-job training available for workers interested in improving their skill sets. *Recommended by: Third Way; AAM*

**▲ Talent–PPPs:** Encourage partnerships with community colleges—creating closer coordination between employers and the local employee pipeline—and provide federal support for regional skills alliances. *Recommended by: PCAST; BI; TW; ITIF*

**▲ Talent–Tertiary Education:** Invest in clean energy and manufacturing education scholarships, post-doctoral fellowships, graduate research grants, and early-career research programs. *Recommended by: BI; Brookings; WRI; CoC; AE; PCAST; ITIF*

**▲ Talent–Vocational/Credentialing/Community Colleges:** Refocus of technical and vocational education, providing a seamless program that bridges high school and post-secondary education to produce the next generation of highly skilled clean energy and manufacturing workers. This effort should include increased support for community colleges by, for example, aligning federal research grants to encourage community college partnerships and increasing support for programs that create and deploy credentials such the DOL's Advanced Manufacturing Competency Model. *Recommended by: AAM; CoC; ITIF; PCAST*

**▲ Talent–Workforce Development (Including Programs Targeted at Veterans):** Invest in state and regional workforce development programs such as the DOL's one-stop training centers to facilitate mid-career course correction and middle skills development in clean energy and advanced manufacturing. This recommendation focuses on the workforce outside of the STEM pipeline. *Recommended by: ASE; Brookings; ITIF; NSTC; PCAST; CoC; AWEA; BGA, United Steelworkers; BI; TW; NSTC*

**■ Improving the Business Climate**

**■ Alternative Fuel and Transmission Infrastructure:** Spur investment in alternative fuel infrastructure, Carbon Capture & Sequestration (CCS), and improved (more energy-efficient) and increased transmission through tools such as targeted tax incentives, financial products, and streamlined permitting and siting processes. *Recommended by: SAFE; CoC; ASE*

**◆ Clean Energy Markets Risks**

**◆ Demand Pull Regulations:** Increase the incentives for large-scale deployment of clean energy through tools such as carbon pricing, utility purchase power agreements (reverse auction mechanism), mandatory disclosure of building and appliance energy use and carbon data, demand-side management, and assure renewables access to the grid. *Recommended by: CAP/CNG; Harvard Kennedy School; Bloomberg; SAFE; ASE; CoC; ITIF; LBNL; AWEA; BGA; United Steelworkers*

**◆ Finance (Adoption-Deployment):** Establish government programs for financing of energy efficiency measures such as Property Assessed Clean Energy (PACE) Financing, renewable energy projects using Real Estate Investment Trusts and Master Limited Partnerships, and retooling or expansion of advanced manufacturing facilities. *Recommended by: ASE; ORNL; Brookings; AWEA; BGA; United Steelworkers; BI, TW*

**◆ Government Procurement:** The federal government should leverage the power of procurement to create demanding early markets for clean energy and advanced manufacturing sectors to scale up production and enjoy economies of scale. *Recommended by: Bloomberg; WRI; SAFE; PCAST; ASE; AAM; NSTC; AEI; Brookings; BI; ITIF; NSTC*

**◆ Green Leasing (Misc.):** Development innovative lease language that realigns the allocation of costs, benefits, and financial risks of energy efficiency investments between tenants and owners. How costs and benefits of efficiency investments and practices are allocated between the owner and tenant is important to determining incentives for energy-efficiency in leased space. *Recommended by: ASE*

**◆ Public Outreach:** Based on multidisciplinary social science research, increase America's energy knowledge and correct misconceptions about manufacturing. For example, the Secretary of Education—in coordination with the Secretary of Energy—should issue guidelines for integrating energy-related curriculum at all education levels, from grade school through post-graduate education tracks—including vocational schools. *Recommended by: CAP/CNG; PCAST.*

**◆ Standards:** Use mechanisms such as appliance efficiency standards, CAFE standards, Renewable Energy Portfolio Standards, building codes, and electricity generation emission standards to ensure a diversity of energy sources and drive demand for energy efficiency and renewable energy technologies. *Recommended by: CAP/CNG; CoC; SAFE; ASE; ORNL; LBNL; AWEA; BGA; United Steelworkers*

**◆ Tax Incentives to Spur Demand:** Provide tax credits and federal financing for energy-efficiency improvements and to accelerate the turnover to advanced technology vehicles. Government can also incentive the adoption of demand-side management tools by utilities through savings goals, financial incentives and time-variant customer rates. *Recommended by: CoC; Harvard Kennedy School; Bloomberg; CAP; CNG; SAFE; ASE; ACEEE; ORNL*

**◆ Technical Assistance:** Enhance industrial access to High Performance Computing resources, Industrial Assessment Centers, Small Firm Energy Management, and Implementation Support Services to identify potential energy saving opportunities. Provide assistance to SMEs for technical challenges; export promotion and increasing knowledge capital through organizations such as NIST's MEP. *Recommended by: Bloomberg; CoC, ORNL; BI; TW; Brookings*

**PUBLIC-PRIVATE PARTNERSHIPS (PPP)–NATIONAL**

**NextEnergy**  
 Nonprofit to accelerate the development and growth of advanced energy industries in Michigan.

**Policies Directly Addressed by the PPP**

**Policies Indirectly Supporting the PPP**

**SEMATECH**  
 Member-based global consortium of semiconductor producers working on pre-competitive research to accelerate commercialization of technology innovations.

**Policies Directly Addressed by the PPP**

**Policies Indirectly Supporting the PPP**

**Oak Ridge Manufacturing Demonstration Facility (MDF)**  
 Facility offering collaborative, shared infrastructure for the development and use of energy-efficient, rapid, flexible manufacturing tech and rapid tech dissemination.

**Policies Directly Addressed by the PPP**

**Policies Indirectly Supporting the PPP**

**Smart Grid Interoperability Panel (SGIP 2.0)**  
 Member-based partnership to coordinate smart grid standards development.

**Policies Directly Addressed by the PPP**

**Policies Indirectly Supporting the PPP**

**Photovoltaic Manufacturing Consortium (PVMC)**  
 Member-based partnership for cooperative R&D among industry, university, and government to accelerate development, commercialization, and manufacturing of next gen photovoltaic systems.

**Policies Directly Addressed by the PPP**

**Policies Indirectly Supporting the PPP**

**Solar Technology Acceleration Center (SolarTAC)**  
 Member-based solar research and testing facility.

**Policies Directly Addressed by the PPP**

**Policies Indirectly Supporting the PPP**

**PUBLIC POLICY RECOMMENDATIONS**

**● Enabling Innovation**

**● Demonstration Facilities:** The U.S. government should establish a mechanism for working with the private sector to financially support and implement large-scale energy technology demonstrations, where such demonstrations are essential to enable private sector adoption of clean energy and advanced manufacturing technologies. *Recommended by: Harvard Kennedy School; BI; Brookings; WRI; ITIF; SAFE; Tassey*

**● Innovation Standards:** Industry CEO's and government leaders should elevate and advance U.S. technical standards (a voluntary consensus standards-setting process)—as applicable to drive innovation in clean energy and advanced manufacturing. *Recommended by: CoC; CAP; CNG*

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**● Public Funding of Pre-Competitive R&D:** The Administration should support annual expenditures on energy and advanced manufacturing R&D. To be effective, this funding must be long-term, stable, and have broad enough bipartisan support to service election cycles. *Recommended by: PCAST; NSTC; Harvard Kennedy School; PCAST; AEIC; BI; Brookings; WRI; CoC; ESLC; AEI*

**● Public Private Partnerships (PPP):** Create and support national and regional public-private, government-industry-academic partnerships to accelerate investment in and deployment of advanced manufacturing, renewable energy, and energy efficiency technologies. *Recommended by: NSTC; BI; Third Way; Brookings; CoC; CAP; CNG; AAM*

**● Technology Development Finance:** Foster a continuum of enhanced capital access for clean energy and advanced manufacturing technologies from start up to scale up. Examples include government managed VC funds the creation of a Green Bank or a Clean Energy Deployment Administration, grants, and loan guarantees. *Recommended by: Bloomberg; CoC; AWEA; BGA; United Steelworkers; PCAST; BI; CAP; CNG*

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**▲ Talent–Broadly Defined:** Talent is labeled as broadly defined when the PPP studied lists talent as a core component of its mission, however, does not identify its breakdown of talent-specific activities.

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**◆ Demand Pull Regulations:** Increase the incentives for large-scale deployment of clean energy through tools such as carbon pricing, utility purchase power agreements (reverse auction mechanism), mandatory disclosure of building and appliance energy use and carbon data, demand-side management, and assure renewables access to the grid. *Recommended by: CAP/CNG; Harvard Kennedy School; Bloomberg; SAFE; ASE; CoC; ITIF; LBNL; AWEA; BGA; United Steelworkers*

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**◆ Government Procurement:** The federal government should leverage the power of procurement to create demanding early markets for clean energy and advanced manufacturing sectors to scale up production and enjoy economies of scale. *Recommended by: Bloomberg; WRI; SAFE; PCAST; ASE; AAM; NSTC; AEI; Brookings; BI; ITIF; NSTC*

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## PUBLIC-PRIVATE PARTNERSHIPS (PPP)–INTERNATIONAL

**Catapult Centres (United Kingdom)**

Network of seven U.K. centers of excellence to advance innovation and make available research and technical expertise, infrastructure and equipment to accelerate commercialization.

**Policies Directly Addressed by the PPP****Policies Indirectly Supporting the PPP****Industrial Technology Research Institute (ITRI) (Taiwan)**

Belgian nonprofit independent research center focused on nanoelectronics and nanotech applied to health care, smart electronics, sustainable energy, and safer transport.

**Policies Directly Addressed by the PPP****Policies Indirectly Supporting the PPP****Fraunhofer-Gesellschaft (Germany)**

German nonprofit organization focusing on applied research in health, security, communication, energy and environment.

**Policies Directly Addressed by the PPP****Policies Indirectly Supporting the PPP****Interuniversity Microelectronics Centre (IMEC) (Belgium)**

Taiwanese nonprofit R&D organization engaging in applied research and technical services in electronics and optoelectronics; IT; materials, chemistry; nanotech; medical device and biomedical technologies; mechanical systems; and green energy.

**Policies Directly Addressed by the PPP****Policies Indirectly Supporting the PPP****GTS Advanced Technology Group (Denmark)**

Network of nine nonprofit research and technology organizations to disseminate knowledge and tech to companies and public institutions to increase Danish innovation and competitiveness.

**Policies Directly Addressed by the PPP****Policies Indirectly Supporting the PPP****PDES, Inc. (United States)**

International industry-government-university member-based consortium working to develop and implement information standards for data exchange.

**Policies Directly Addressed by the PPP****Policies Indirectly Supporting the PPP**

## PUBLIC POLICY RECOMMENDATIONS

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The Council's mission is to set an action agenda to drive U.S. competitiveness, productivity and leadership in world markets to raise the standard of living of all Americans.

The Council on Competitiveness is the only group of corporate CEOs, university presidents and labor leaders committed to ensuring the future prosperity of all Americans and enhanced U.S. competitiveness in the global economy through the creation of high-value economic activity in the United States.

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### HOW WE OPERATE

The key to U.S. prosperity in a global economy is to develop the most innovative workforce, educational system and businesses that will maintain the United States' position as the global economic leader.

The Council achieves its mission by:

- Identifying and understanding emerging challenges to competitiveness
- Generating new policy ideas and concepts to shape the competitiveness debate
- Forging public and private partnerships to drive consensus
- Galvanizing stakeholders to translate policy into action and change



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