Sustainable Infrastructure Draft Recommendations

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#8: Establish Emerging Technology (EmT) office in federal agencies

Updated

The Federal Government should establish an Emerging Technology (EmT) office within each of the federal agencies.

Justification

- EmT is rapidly evolving, with transformational value, and unexplored opportunities
- Agencies lack expertise, resources and capacity to plan and implement agency strategy, policy development and support, practices, programs and actions
- Limited EmT coordination between agencies lead to uneven treatment, policies and siloed execution

Implementation

- Use language specified in the Oversee Emerging Technology Act (S.1577, 5/11/2023)
  - advising on responsible use of emerging technologies
  - providing expertise on responsible policies and practices, collaborate with officials and coordinating bodies across the Federal government, and offer input for responsible procurement policies
  - identify the official and provide a description of the official's authorities and responsibilities to Congress
- Establish specialized capabilities – smart cities, AI, etc., in each office

Barriers

- Limited funding
- Limited expertise and resources in-agency
- "emerging tech" is broad (AI, IoT, quantum, etc.)
- Some agencies may have some existing EmT roles

Agencies

The 24 CFO Act agencies, with consideration being given to the non-CFO Act agencies

Federal considerations

- Agencies consider participating in a Community of Practice, like the Federal CIO Council format, which, in turn, will serve to convene EmT officials across all agencies
- Recommendation in parallel with the National Emerging Technologies (EmT) Office
- Establish new and/or leverage existing FACAs to augment knowledge and expertise gaps
- Establish process for defining what EmT is, and a list of EmT

#11: Establish a national Emerging Technology program office

Updated

The Federal Government should establish a national Emerging Technologies Program Office within the Executive office of the President to ensure that the federal government, state, and local government entities can effectively plan, implement, and manage emerging technology initiatives across the United States.

Justification

- Lack of coordination from the Executive Office leads to siloed planning, policies, execution, suboptimal utilization of resources, duplicate programs, monitoring
- Slow adoption and integration of emerging technologies into US economy and infrastructure, thus limiting realization of economic, social, security and other values and benefits

Implementation

- Use language specified in the Global Technology Leadership Act (S.__, 6/8/2023) for some of the functions
  - Identify technologies that matter most to US economic and national security
  - Assess US capacity with each, including manufacturing, workforce, supply chain, capital access and R&D
  - Evaluate technology leadership relative to other countries
  - Determine appropriate policy response
- Establish specialized capabilities within the program office – smart cities, AI, etc.
- align with the U.S. Chief Technology Officer Team

Barriers

- Siloed execution and Lack of coordination from the Executive Office
- Minimal support from designated agency leadership
- Lack of branding
- Lack of coordination, stakeholder engagement, resource allocation, and performance monitoring

Agencies

This office should be aligned with the Office of Science and Technology Policy to: 1) work with federal departments and agencies and with Congress to create bold visions, unified strategies, clear plans, wise policies, and effective, equitable programs for IoT and Smart Cities modernization; 2) engage with external partners, including industry, academia, philanthropic organizations, and civil society; state, local, Tribal and territorial governments; and other nations; and 3) ensure equity, inclusion, and integrity in all aspects of IoT implementations

Federal considerations

- Roles, responsibilities and interactions with the EmT function in the federal agencies
- Roles, responsibilities and interactions with states
- Establish new and/or leverage existing FACAs to augment knowledge and expertise gaps
- Ensure that the Coordination and Integration with the NIST (FWIoT and GCTC) protocols are in place, i.e. IoT implementations involve the integration of multiple technologies, systems, and stakeholders.

#13: Promote development and adoption of industry standards in sustainable infrastructure

Updated

The federal government should promote the development and adoption of existing industry standards activities with respect to energy efficient, clean, and renewable energy technologies that are used in sustainable infrastructure.

Justification

- Interoperability: Several proprietary technologies where standardization can address this
- Scalability: Provides consistency or uniformity
- Innovation and competition: Level playing field
- Cybersecurity: Mitigate risks associated with DERs
- Cost savings: Simplified Procurement
- Regulatory compliance: Foundation for future policies
- International Harmonization: Facilitate market entry

Implementation

- Encourage Inclusiveness
- Prioritize identified gaps
- Build on existing standards
- Encourage flexibility and adaptability
- Promote adoption
- Global Collaboration
- Procurement/Grants
- Working with the States

Agencies

- NIST
- DHS
- DoT
- DoE
- CISA
- Others
- USDA
- EPA

Barriers

- Time consuming and resource intensive efforts to achieve consensus
- Technological Advances
- International harmonization adds more complexity and time
- Fragmentation
- States adoption of standards

Federal considerations

#14: Address the labor shortage in renewable energy industry

Updated

The federal government should develop and facilitate programs and grants to reskill existing workers, train future workers across manufacturing, construction, and clean tech/renewable industries

Justification

- IoT is a critical technology in renewable energy systems
- Ongoing labor shortage is exacerbated by IRA funding, which is estimated to create 537K new jobs annually threaten to derail carbon free power generation by 2035 and carbon free economy by 2050
- Shortages are in power generation (28%), manufacturing energy components (11%), energy efficient buildings (18%)
- Electricians and installers ~~(construction) hard to find~~

Implementation

- Leverage existing initiatives and programs that address workforce development

Agencies

- Department of Energy (renewable energy, electrification, etc.)
- Department of Commerce
- Department of Labor
- Department of Education

Barriers

- Labor shortage in renewable and adjacent industries (manufacturing, construction)
- Lower wages in renewables than in other industries

Federal considerations

- Consider integration with existing workforce development programs and infrastructure

#15: Promote development and adoption procedures that accelerate and streamline planning, permitting, and interconnection aspects related to energy efficient technologies

Updated

The federal government should promote the development the development and adoption of procedures and methods that can accelerate and streamline planning, permitting, and interconnection aspects related to energy efficiency technology projects. Many of these energy efficient technologies incorporate the use of IoT

Justification

- Incorporation of technologies enabled by IoT (smart inverters, energy storage systems)
- Deployment of critical electric transmission to move electric power from location constrained renewables
- Installation and Operation of Rooftop Solar Panels- improving the permitting and interconnection process
- 70 to 80% of projects never make it past permitting and interconnection queue to commercial operation

Implementation

- Permitting legislation being discussed in Congress
- DOE RFI designation of National Interest Electric Transmission Corridors (NIETCs)
- FERC-Back-stop siting authority
- Use of Existing Rights of Ways (railroads and highways)
- DOE Solar APP+

Agencies

- FERC
- DoT
- DoE
- FRA
- Others

Barriers

- Time consuming and resource intensive-developers lose interest and cancel projects
- Overcoming Resistance
- Cost- accounting for them accurately and acceptably
- Supply chain
- Grid infrastructure requires developers to pay for upgrades to support energy source

Federal considerations

#16: Accelerate the promotion and adoption of procedures and methods to make the electric grid more reliable and resilient

Updated

The federal government should accelerate the promotion and adoption of procedures and methods that include IoT technologies to make the electric grid more reliable and resilient. A more reliable and resilient grid can better accommodate the integration of renewable energy sources enabled by IoT

Justification

- Incorporation of technologies enabled by IoT (smart inverters, energy storage systems)
- Quicker restoration from natural and man-made threats
- Energy Efficiency- more efficient transmission of electricity
- Cost Reduction- both for utilities and consumers

Implementation

- DOE Funding
- Near-term technologies to provide short-term solutions at a lower cost (Dynamic Line Ratings, Volt/Var, Power-Flow Controllers, Energy Storage, Distributed Energy Resources, and Demand Response
- Microgrids that operate and function as a grid resources

Agencies

- FERC
- NERC
- DoE
- Others

Barriers

- Resources- significant labor and cost implications
- Moving away from the traditional process that utilities use to determine rates
- Supply Chain- ongoing issue with distribution transformers

Federal considerations