The U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
Solar Energy Technologies Office (SETO)

Request for Information:
Challenges and Opportunities for the American Solar Industry
DE-FOA-0002055

Response

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Summary Recommendation

The DOE should continue its active leadership and engagement in establishing and promoting federally recognized machine readable data standards for digital communications and electronic transactions for the construction and operations of the Smart Grid infrastructure to promote ConstrucTech, InsurTech and FinTech innovation and competition enabled by the cost effective and reliable Orange Button data exchange, and to prevent silo approaches, proprietary systems, endorsements or exclusivity given to any provider of products or services.

Request for Abstract Responders

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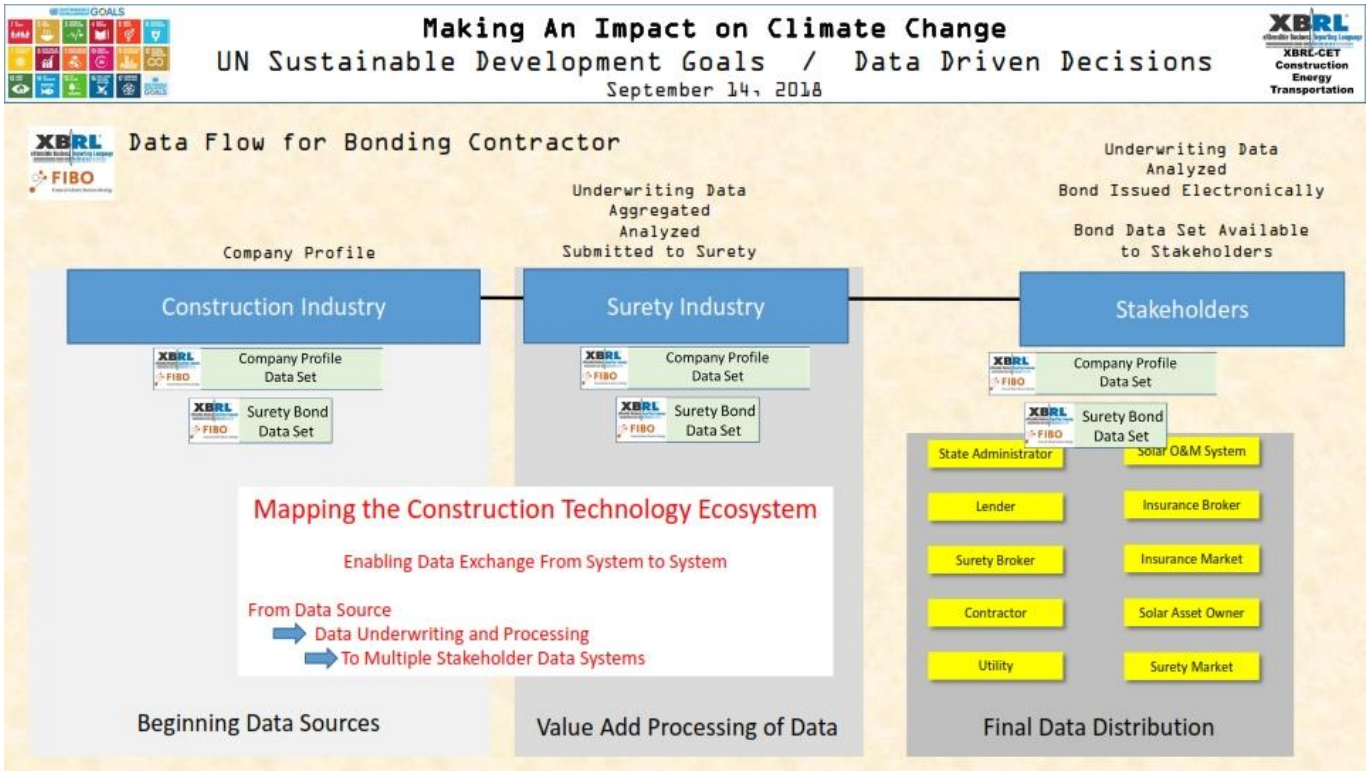


From the September 14, 2018 Impact Event during the Global Climate Action Summit

Executive Summary

Modernizing the energy infrastructure from a legacy of utility self-reliance under a single tightly controlled environment delivering one directional energy, to a dynamic Smart Grid marketplace with bi-directional energy generated from multiple stakeholders is a daunting challenge, and an incredible opportunity.

This RFI response is not about advocating new ideas for products and services that will result in a more efficient Smart Grid, but to leverage the existing work that has recently been completed under the leadership of the DOE, NREL, the SunShot program, leading utilities, XBRL US, SunSpec Alliance and a collaboration of public/private stakeholders under the Green and Orange Button efforts to develop data interoperability and data analytics as the foundation that promotes innovation and competition.

This RFI response instead advocates for continuing DOE Green/Orange Button public/private collaboration efforts to establish federally recognized machine readable data interoperability throughout the national energy infrastructure supply chain as a Public Benefit, and for the DOE to now integrate the construction community into the collaboration.

To re-invent our nation's energy infrastructure, there must be a focus on improving the quality and efficiency of data interoperability across the lifecycle of a solar asset. This RFI response proposes to "follow the money" by focusing on financial data reporting as the carrot, and the construction industry as the stick. In addition to existing XBRL financial reporting standards, the construction industry is leading an effort to help government and project owners define policies and procedures that better serve their third-party (3P) contractors.

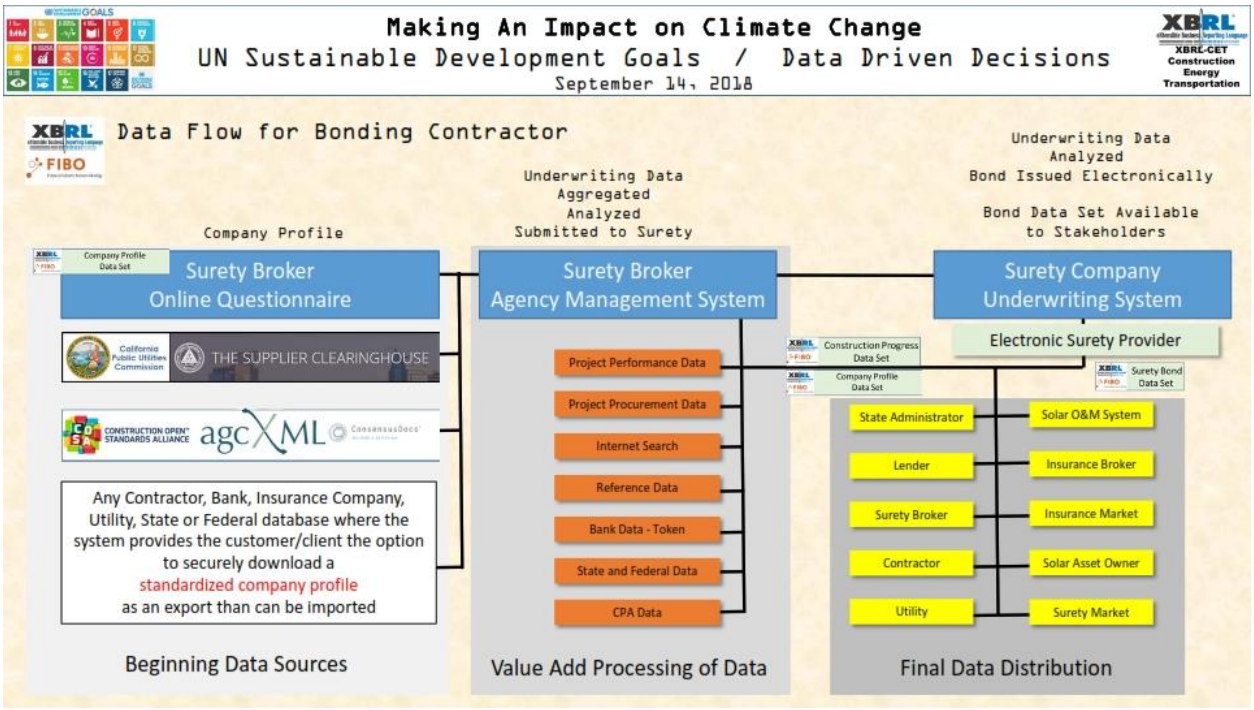
Improving data interoperability in construction has a synergistic effect across the lifecycle of a solar asset, but that value depends on the reliability of the data, from generating short term efficiencies between 3P contractors and their local Authority Having Jurisdiction (AHJ), to improving data quality and retention for analytics and forecasting. By joining existing efforts by the Construction Progress Coalition (CPC) to produce Common Data Exchange (CDX) for solar projects to align industry best practice with existing DOE Orange Button XBRL standard taxonomy.

The emerging FinTech and InsurTech industries can utilize the Public Benefit DOE Green/Orange Button data interoperability to improve current services and develop new innovative products. For example, an *Impact Underwriting** Surety Based Risk Management "FinTech/InsurTech" structure as an optional approach to participating in the On-Bill Repayment program, where improved underwriting and risk management is achieved through data driven decisions and AI enabled by data interoperability.

Executive Summary – Continued

Supply-chain data interoperability is a massive challenge for any service based industry, including 3P contractors and their insurance providers. However, a CDX protocol based on existing DOE Green/Orange Button taxonomy to improve B2B (business to business) and B2G (business to government) data exchanges simultaneously is a "win-win-win" between the needs of 3P contractors, local utility inspectors, and the general public.

Industrywide adoption of data interoperability standards is no longer a challenge of technology. The challenge is finding consensus between impacted stakeholders, that when overcome will produce a Public Benefit that enables Commercial Interests to advance the industry.



* The term "Impact Investment" reflects when specific investment decisions are being directed by a desire for the investment to support specific activity that is focused on clean energy, or similar social objectives, to make an Impact on Clean Energy.

The term "Impact Underwriting " reflects when specific financial products and associated underwriting decisions are being directed by a desire for the financial product to support specific activity that is focused on clean energy, or similar social objectives, to make an Impact on Clean Energy.

Data Interoperability for Impact with On-Bill Finance as a Model

During the recent Global Climate Action Summit in San Francisco the On-Bill Repayment program was presented as a model example where a limited number of data elements are shared by a wide range of stakeholders. Where data interoperability and *Impact Policy* for mandated electronic transactions could significantly reduce soft costs throughout the supply chain, promote *Impact Programming* for development of innovative software applications, increase *Impact Underwriting* for innovative financial products and services from emerging FinTech and InsureTech companies and attract better financing from *Impact Investors*.

Collaborations already are demonstrating how data interoperability can be leveraged to promote competitive financing for installing solar by enabling portfolio scale digital performance monitoring for risk management form the smallest solar carport to the largest utility scale facility, all while expanding the pool of qualified solar installation contractors by improving access to surety credit and other resources.

A starting point can be the Solar Energy Industries Association (SEIA) proposed nationally standardized permit process, SolarApp, as part of a future On-Bill Repayment program where the initial data elements are ultimately used by a wide range for stakeholders using different systems for permitting, utility administration, financing, estimating, construction, regulatory oversight, insurance, surety and operations once constructed.

The expanded DOE Orange Button XBRL taxonomy now has data elements for electronic bonding, for administering and monitoring construction of energy infrastructure and ongoing performance measurement of completed facilities, all of which could be leveraged by a national permit process.

Expanded Recommendations for DOE

Support and continue funding the Orange Button initiative to establish data interoperability of federally recognized machine readable date standards available as a public resource without sunset.

Support the Orange Button initiative to establish data interoperability of federally recognized machine readable date standards for all forms of energy production and storage with standardized data sets, performance benchmarks and trade association supported model contract language for financial products and services.

The DOE effort should not be limited to a silo approach, but part of an international effort to address the challenge of climate change, and in support of the UN Sustainable Development Goals, Taskforce on Climate Related Financial Disclosures (TCFD), Global Sustainability Index Institute (UNGSII) along with California efforts AB 32, the Global Warming Solutions Act of 2006, SB350 the Clean Energy and Pollution Reduction Act of 2015 and 2018 SB 100 the California Renewables Portfolio Standard Program.

Collaborate on projects in support of cities engaged in the UNGSII Cities Leadership Platform and the American Cities Climate Challenge, along with cities participating in CDX pilots for building infrastructure projects levering data interoperability and electronic transactions.

Support the Call to Action as outlined during the Opening Presentation at the 2018 Global Climate Action Summit Impact Event and engage with future Impact Events

July 17	Olympic Club	San Francisco
September 23	UN Climate Summit	New York
September 25	Solar Power International	Salt Lake City (Topic submitted)

Collaborate with industry trade associations in developing national standardized “best practice” model contracts along with related finance, insurance and surety forms in a digital format for electronic transactions and data interoperability with utility systems based on the DOE Orange Button and the Construction Progress Coalition (CPC) Common Data Exchange (CDX).

Collaborate with the financial markets to identify standardized system performance data metrics and benchmarks utilizing DOE Orange Button that quantify contractual obligations, along with providing default cure parameters based on performance data for use in model contracts along with standardized insurance and bank forms.

Support legislation like the “Electronic Surety Act” being explored that would mandate all public and regulated entities provide the option for open standards based electronic surety bonds as an alternative to manually processed paper bonds.

Require where possible, or endorse and encourage the Orange Button Data Standards in federally recognized machine-readable format to enable data interoperability with all Smart Grid stakeholders to promote innovation and support third party FinTech and InsurTech strategic undertakings.

Collaborate on a pilot for transitioning the permitting process to the standardized best practice digital model with electronic transactions and data interoperability with utility systems based on the DOE Orange Button and the Construction Progress Coalition (CPC) Common Data Exchange (CDX).

> This will address the *18,000 Authorities Having Jurisdiction and the approximately 3,300 investor owned, co-operative, and municipal utilities.*

Collaborate on a pilot for transitioning the interconnection, construction and operations of energy generation facilities utilizing a standardized best practice digital format with electronic transactions for contracts, surety bonds and letters of credit, with data interoperability with utility systems based on the DOE Orange Button and the Construction Progress Coalition (CPC) Common Data Exchange (CDX) for performance measurement.

> This will enable solar system performance measurement data "*to increase the solar energy customer base by developing new financial instruments or means to assess risk that focus on other relevant factors.*"
>
> Enabling the capital and financial markets to have risk assessment data that is not constrained to just a credit score, will help any number of companies demonstrate the type of digital information that will expand their access to capital, insurance and surety.

DOE should coordinate and administer the continuation of STEM education programs to provide students with educational opportunities related to building the Smart Grid in areas like taxonomy development for AI applications for fighting climate change, producing both an expanding taxonomy resource for FinTech/InsurTech innovations and graduates prepared for the new demands of a digital economy.

DOE should support and fund a Wellness Program in collaboration with similar efforts. The transition to digital is going to be disruptive and have a negative impact on a number of people as increased anxiety and depression. Advocacy for disruptions should include recognition of the potential negative impacts, with steps taken to counter the negative and explore positive outcomes. Clean energy industries are a major employer for veterans, and a significant portion of those jobs are in the construction of clean energy facilities where a high percentage of individuals would benefit from a Wellness Program, where outreach, education and specialized programs could bring awareness to the problem and share what co-workers can look for with the resources to leverage.

Support the American Resilience Project and be interviewed for the Current Revolution documentary on modernizing the grid. The Introduction at the Global Climate Action Summit and Roger Sorkin's comments provide the context for the documentary.

Recommended Action Plans

Action Plan - Data Interoperability

Promote the use of XBRL, FIBO and other federally recognized machine readable data standards to stimulate innovation and competition.

Prohibit the use of proprietary data standards for data exchange that constrains innovation and stifles competition for compliance with public laws.

Promote the use of industry trade group published data sets to be synergized with federally recognized machine readable data standards like XBRL and FIBO, and to have the respective trade associations maintain and update their data sets as warranted and under their control, and for the benefit of their constituency.

Prohibit any industry trade group from imposing any constraints, licensing requirements, or fees of any kind on the use of the trade association data set if that data set is contributed to, and incorporated into, machine open data standards like XBRL and FIBO.

Action Plan – Digital Commerce

Promote the use of secure electronic bonds. There are a number of competitive companies that already provide the service now and are in place ready to serve.

Prohibit the continued use of expensive and burdensome paper bonds that are subject to fraud.

Promote the use of competitive industry standardized surety bond delivery and administration systems on all public works.

Prohibit public agencies from imposing proprietary bond delivery and administration systems. Examples are PennDOT and Nationwide Multistate Licensing System and Registry (NMLS)

Action Plan – Multi-agency data interoperability

Require all federal, state and local agencies to adopt federally recognized machine readable data standards like XBRL and FIBO as part of any funding provided by the government under MGT Act, the Federal Information Technology Acquisition Reform Act and others that provide funding for system upgrades.

Prohibit all federal, state and local agencies that receive funding from adopting or implementing a data standard or reporting requirement that does not utilize federally recognized machine readable data standards like XBRL and FIBO, or any requirement that is a "silo approach" to a single industry, trade association, or government entity.

Action Plan – Cyber

Promote the engagement of stakeholders in best practices for cyber risk mitigation by the federal government providing clear policies and procedures as part of the Cybersecurity Information Sharing Act that when followed provide legal liability cover for all entities and stakeholders.

Provide a national defense posture for providing private entities and stakeholders with a national cyber protection resource, including real time monitoring and threat detection, to establish an offensive approach to mitigating cyber risk.

Provide a clear demarcation of liability resulting from a cyber-attack, where the government assumes liability for consequential liabilities and the entity attacked is only responsible for their internal costs and recovery expenses with the objective of providing the insurance market with a quantified risk and limited exposure to make cyber insurance more affordable and responsive.

Engage with our working group members as part of the National Cybersecurity Public-Private Partnership.

Response to Specific Questions

Category 1: Crossing Traditional Boundaries to Reduce Soft Costs

1. Would regional collaborations to standardize and harmonize solar permitting, inspection, interconnection, and financing processes be an effective strategy for reducing regulatory burden on solar businesses?

   Yes, most definitely, however the harmonizing should be on a national basis not constrained to regional area.

   The multiple and different processes, policies and procedures among the many regulatory agencies and utilities crates a tremendous burden on all stakeholders.

   Which stakeholders and regional groups would need to be part of such efforts in order to be effective?

   There are various efforts to standardize and harmonize processes by establishing data interoperability based on federally recognized machine-readable data standards, and they are converging around the DOE Green/Orange Button.

   One multi-trade and multi-stakeholder collaboration is the Construction Progress Coalition (CPC), Surety Resource Connection (SRC) and XBRL US (XBRL), for continuing DOE Green/Orange Button public/private effort to establish federally recognized machine-readable data interoperability throughout the national energy infrastructure supply chain.

   The Solar Energy Industry Association (SEIA) is active in this issue as well, and released the following press release during the recent Solar Power International conference - Solar Industry Unveils Campaign to Streamline Solar Permitting for the SolarAPP.

2. What other recommendations do you have for research that can cross traditional boundaries to reduce the regulatory burden on installations, for example via innovative public-private partnerships?

   During the recent Impact Event during the Global Climate Action Summit in San Francisco the On-Bill Repayment program was presented as a model example where a limited number of data elements are shared by a wide range of stakeholders. Where data interoperability and Impact Policy for mandated electronic transactions could significantly reduce soft costs throughout the supply chain, promote *Impact Programming* for development of innovative software applications, increase *Impact Underwriting* for innovative financial products and services from emerging FinTech and InsureTech companies and attract better financing from *Impact Investors*.

   The DOE/CPC/SRC/XBRL collaboration will demonstrate how data interoperability can be leveraged to promote competitive financing for installing solar by enabling portfolio scale digital performance monitoring for risk management form the smallest solar carport to the largest utility scale facility, all while expanding the pool of qualified solar installation contractors by improving access to surety credit and other resources.

   A starting point can be the proposed nationally standardized permit process as part of the On-Bill Repayment program where the initial data elements are ultimately used by a wide range for stakeholders using different systems for permitting, utility administration, financing, estimating, construction, regulatory oversight, insurance, surety and operations once constructed.

3. How can existing solutions and best practices for permitting, inspection, and interconnection processes be more effectively and expeditiously transferred to other jurisdictions?

   The adoption and implementation of data interoperability enabled by DOE Orange Button, XBRL and CDX assures emerging solutions are available to any jurisdiction, and across market and industry segments.

4. What tools or technical support is necessary for such knowledge transfer?

   DOE Orange Button
   Solar Energy Industry Association (SEIA)
   Smart Electric Power Alliance (SEPA)
   XBRL for Solar and Surety
   Construction Progress Coalition (CPC)
   Orange Button Translate
   SolarAPP

Category 2: Streamlining Solar Permitting, Inspection and Interconnection

1. Are there models that exist for optimal permitting, inspection, and interconnection processes for (a) residential rooftop, (b) commercial, and (c) community solar projects? Please provide as much detail as possible.

   There are various applications that develop construction estimates and savings forecasts for installing solar systems that generate the data that is used for permitting, inspection, and interconnection.

   Solar Automated Permit Processing (SolarAPP)

2. What remaining challenges for reducing permitting, inspection, and interconnection costs for (a) residential rooftop, (b) commercial, and (c) community solar projects can best be addressed by federal government funding for technical assistance, stakeholder convening, training programs, and/or the development of new online tools for streamlining these processes?

   This is not a technical challenge, it is a consensus challenge. The DOE can encourage and endorse efforts for the national permit process, and fund the costs for expanding he XBRL taxonomy to incorporate any additional data elements for the national permit process and On-Bill Repayment.

3. As new solar plus other distributed energy resource systems (e.g. behind-the-meter storage, electric vehicle charging) are deployed, what new permitting, inspection, and interconnection challenges are emerging? What novel approaches could apply lessons learned from solar-only permitting, inspection and interconnection?

   Energy storage needs to considered in tandem with any system, and storage related data elements should be incorporated into the DOE Orange Button taxonomy.

   The Advancing Contracting in Energy Storage Working Group (ACES) is currently exploring best practices for energy storage.

4. What are the unique permitting, inspection, and interconnection challenges faced by cooperatives and municipal utilities? How could federally funded research, analysis or technical assistance funding appropriately help?

   Regardless of what of entity is looking to install solar, the need for standardized data will be critical.

5. In the area of environmental permitting, what are the highest priority research areas that would best contribute to the knowledge base on the type and magnitude of avian impacts at utility-scale PV and/or concentrating solar power facilities? How could improved transparency, data collection methodology, and/or sharing of avian-solar data better inform deployment initiatives?

   Standardized data will be critical for any reporting and evaluation, including avian related issues.

Category 3: Achieving Low-Cost Residential Solar Financing

1. What gaps exist in the local financial institution market (e.g. community banks, credit unions, and Community Development Financial Institutions) that constrain investing in solar assets within their communities?

   Implemented Standard data standards for monitoring construction and operations of solar assets.

2. What tools or resources do those local financial institutions need in order to successfully enter the solar market?

   Data analytical systems that can leverage data interoperability for monitoring construction and operations of solar assets.

3. What metrics or methods have been developed, in addition to traditional credit scores, to help enable access to solar for a larger number of Americans?

   Surety Based Risk Management that leverages Orange Button XBRL data interoperability to monitor construction and system performance for operations of solar assets.

4. Are there examples where innovative underwriting methodologies have been used to facilitate lending?

   Power Purchase Agreement financial guarantees supported by monthly system performance monitoring.

   Proposed On-Bill Repayment financing

5. How do these metrics or methods vary from those used by traditional local lenders to could determine repayment risk?

   Utilizes data on system performance and cash flow to determine solar asset value for underwriting instead of GAAP accounting.

6. Are there examples of the successful integration of energy assistance programs and solar project finance in lower income communities? If so, are they being widely applied and what inhibits these innovations from being extended to other communities? Who are the appropriate stakeholders and what methods could be applied to driving innovation?

   We are not aware of any assistance programs in lower income communities that currently use data standards efficiency deliver services or promote investment.

   However, reducing soft costs and providing access to competitive financing will have the great impact on lower income communities.

7. What tools could enable local financial institutions to leverage incentives (e.g., Community Reinvestment Act, Low Income Housing Tax Credit), especially for projects that expand access to lower income communities (individuals and businesses)?

   On-Bill Repayment with reduced soft costs and providing access to competitive financing will have the great impact on lower income communities.