

# SC/OSTI Proposed or Completed Actions in Response to ASCAC-STI Subcommittee Report (9/4/15)

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Office of Science  
U.S. Department of Energy



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Science



# Quick Recap of Chronology

- **November 2014.** Dr. Dehmer's charge letter:
  - Are OSTI products and services "best in class?"
  - Do they meet customers' current and future needs?
  - What is OSTI's national and international standing; where must it be a clear leader?

## Subsequent questions

- Is the mission statement sensible in light of the statutory authorities?
  - Is OSTI organized and staffed to accomplish today's mission?
  - Are the current and planned products and services the correct ones?
  - What suggestions would the subcommittee make for the next steps?
- **March 2015.** Hitson provided OSTI overview briefing to ASCAC.
  - **May 2015.** ASCAC-STI Subcommittee performed on-site review at OSTI in Oak Ridge. Chaired by Tony Hey.
  - **July 2015.** Tony Hey presented ASCAC-STI report summary to full ASCAC.
  - **September 2015.** ASCAC Chair Roscoe Giles transmitted formal report to Dr. Dehmer.

# ASCAC-STI Summary

## 1) Observations

- Progress in addressing 2009 COV recommendation to focus resources on DOE R&D results
  - Re-balance/Re-focus initiative; strategic plan; product consolidation/streamlining
  - Reorganization around three core functions of “collect, preserve, disseminate”
- Progress in fixing “leaky pipes” and lack of comprehensiveness in STI submissions

| <u>STI Submissions</u> |             |             |             |
|------------------------|-------------|-------------|-------------|
| <u>FY12</u>            | <u>FY13</u> | <u>FY14</u> | <u>FY15</u> |
| 20,205                 | 28,793      | 41,867      | 44,795      |

- DOE’s leadership in implementing new public access requirements (DOE PAGES<sup>Beta</sup>)
  - Partnership with NSF and DOD
  - Minimize submission burden

# ASCAC-STI Summary

## 1) Observations (cont'd)

- “Best in class” product aspects:
  - SciTech Connect’s semantic search
  - ScienceCinema’s audio-indexing technology
  - Federated search engines Science.gov and WorldWideScience.org
  - WorldWideScience.org’s multilingual translation technology
- OSTI’s Data ID Service and its role in promoting data discoverability
- Not “best in class” – Energy Science and Technology Software Center (ESTSC)
- OSTI’s primary customer “groups” are: (a) public, (b) librarians, and (c) researchers
  - **OSTI is effectively reaching first two but needs to better understand needs of researchers.**
  - To researchers, OSTI services seem cumbersome compared to existing domain-specific solutions
- Researchers see need for more integration of OSTI products and improved user interface
- The OSTI team’s overall enthusiasm, competency, innovation, and adaptation to evolving technology trends
- Change in the mix of technical expertise and skills will be needed

# ASCAC-STI Summary

## 2) Recommendations to OSTI

1. If OSTI is to truly fulfill its mission to create products and services to make 'R&D findings available and useful to DOE researchers', it needs to initiate **a vigorous outreach program with the DOE Lab researchers.**
2. OSTI should work with the DOE research community to **re-invent the ESTSC software service.**
3. Work with the labs to **identify 'researcher champions'** who can work with the STIP community **to strengthen the link to researchers.**
4. OSTI should work aggressively to continue toward **a unified user environment with a limited number of, clearly delineated, non-redundant tools** and develop a master plan for future development and areas of expansion through community input.
5. Through partnership with the national lab librarians and researchers identify and **address publication content gaps** and develop clear instructions and guidelines regarding content submission requirements.

# ASCAC-STI Summary

## 2) Recommendations to Office of Science

1. To promote a **successful implementation of the public access requirement** issued by OSTP, OSTI needs top-down support from DOE in clearly communicating that this is not a requirement/burden imposed by OSTI but rather a government-wide and DOE-wide requirement meant to share federal research results and accelerate scientific progress. In this regard, labs, grantees, and their authors need to be incentivized to comply with this requirement, which partnership with OSTI staff can help them to fulfill, and one such incentive could be a **measurable expectation expressed in labs' annual performance plans**.
2. The Office of Science should consider **defining a useful role for OSTI and the STIP management team in managing DOE data**. (Six “possible roles” suggested.)

# OSTI Strategies/Actions

## Strategy 1 - Strengthen Ties to DOE Researchers

(Addresses OSTI Recommendations 1 and 3)

### Actions

#### *Near Term*

- Hold a “Round 1” series of results-oriented workshops/“listening” sessions at DOE labs to address questions such as:
  - Where and how do researchers use STI in their workflow;
  - How can OSTI’s STI products and/or STI content be more useful to researchers;

#### *FY17*

- Hold a “Round 2” series of centrally-located, community-driven workshops focused on specific STI types (data, software, etc.).
- Other secondary Actions...

# OSTI Strategies/Actions (cont'd)

## Strategy 2 - Enhance Product Cohesiveness and Comprehensiveness

(Addresses OSTI Recommendations 2, 4, and 5)

### Actions

*FY16-17*

- Re-invent software service, integrated with other STI types, in tune with researchers' workflow needs.

BEFORE

“Software in Isolation”

AFTER

Toward a “unified user environment”

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### Search Results

Results For: **Package Detail Must Contain (ENERGY)**  
Matched 884 reports, displaying records 1 to 884

| ESTSC Package Acronym | ESTSC Package ID | Package Name  |
|-----------------------|------------------|---|
| ALGORITHM FOR ACCNT   | 002651BIMPC00    | Algorithm for Accounting for the Interactions of Multiple Renewable Energy Technologies in Estimation of Annual Performance |
| COMBAT                | 003070BIMPC00    | Comm Building   |
| USEGMV2.0-2.X         | 001484BIMPC01    | U.S. E V2.0-  |
| MECM                  | 002627BIMPC00    | Motor Energy Conservation Measures  |
| SSECM                 | 002630BIMPC00    | Steam System Energy Conservation Measures   |
| PASS                  | 002647BIMPC00    | Detailed Photovoltaic Analysis Simulation Spreadsheet   |
| CAMPUS ENERGY MODEL   | 003655BIMPC00    | Campus Energy Model for Control and Performance Validation  |
| MEAM SPLINE           | 002751MLTPL00    | MEAM interatomic force calculation subroutine for LAMMPS  |
| MEAM+SW V. 1.0        | 002751MLTPL01    | Modified Embedded Atom Method   |
| REO                   | 002646BIMPC00    | Renewable Energy Cost Optimization Spreadsheet  |
| HESCORE               | 003349MLTPL00    | Home Energy Scoring Tools (website) and Application Programming Interfaces, APIs (aka HEScore)                              |
| SEED PLATFORM         | 003037BIMPC00    | Standard Energy Efficiency Data Platform  |
| SOLOPT                | 002631BIMPC00    | SoLOpt  |
| HES V.2.0             | 002587MLTPL00    | Home Energy Saver v.2.0   |
| HOMER®                | 002642BIMPC00    | HOMER® Energy Modeling Software   |
| HOMER® 2003           | 002642BIMPC03    | HOMER® Energy Modeling Software 2003  |
| HOMER® V2.0           | 002642BIMPC01    | HOMER® Energy Modeling Software V2.0  |
| HOMER® V2.19          | 002642BIMPC02    | HOMER® Energy Modeling Software V2.19   |
| HOMER® V2.63          | 002642BIMPC04    | HOMER® Energy Modeling Software V2.63   |
| HOMER® V2.63          | 002642BIMPC04    | HOMER® Energy Modeling Software V2.63   |
| HOMER® V2.64          | 002642BIMPC05    | HOMER® Energy Modeling Software V2.64   |
| HOMER® V2.65          | 002642BIMPC06    | HOMER® Energy Modeling Software V2.65   |
| HOMER® V2.67          | 002642BIMPC07    | HOMER® Energy Modeling Software V2.67   |
| MARS12                | 001036SUN0000    | Energy Deposition Calculation for High Energy Particle Interaction Various Mats   |
| DCSM                  | 002632BIMPC00    | Duty Cycle Software Model   |

“unified user environment”

SciTech Connect

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energy

Semantic Search for: energy

Sort by Relevance

| Category             | Count      |
|----------------------|------------|
| Everything           | 61,914     |
| Electronic Full Text | 2,813      |
| Citations            | 58,127     |
| Multimedia           | 6          |
| Datasets             | 138        |
| <b>Software</b>      | <b>830</b> |

1. WEC-Sim (Wave Energy Converter - Simulator)

WEC-Sim (Wave Energy Converter SIMULATOR) is a code developed by Sandia National Laboratories and the National Renewable Energy Laboratory to model wave energy converters (WECs) when they are subject to operational waves. The code is a time-domain modeling tool developed in MATLAB/Simulink using the multi-body dynamics solver SimMechanics. In WEC-Sim, WECs are modeled by connecting rigid bodies to one another with joint or constraint blocks from the WEC-Sim library. WEC-Sim is a publicly available, open-source code to model WECs.

2. Photovoltaic Energy Valuation Model v 1.0

Currently, there is a need identified by Kennebecott Land, as well as others in the real estate, appraisal and building industry to come up with a tool that is simple to use and can accurately value the electricity produced by a solar photovoltaic system. In the appraisal industry, comparable properties are used to help in the valuation of a residential property. Absent a comparable feature such as photovoltaic panels on a neighboring property, it is difficult for appraisers to assign a value to that system. In many cases, photovoltaic systems are assigned a value of \$0, which essentially ignores the

3. Grain boundary energy in 5 degrees of freedom space

GB5D0F is a program written in MatLab for computing excess energy of an arbitrary grain boundary defined by its 5 geometrical degrees of freedom. The program is written in the form of a single self-contained function callable from within commercially available MatLab software package. The function takes a geometric description of the boundary and material identity as input parameters and returns the predicted boundary energy.

4. Motor Energy Conservation Measures

This software requires inputs of simple motor inventory information and calculates the energy and cost benefits of various retrofit opportunities. This tool includes energy conservation measures for: High Efficiency Motor retrofit and Cogged V-belts retrofit. This tool calculates energy savings, demand reduction, cost savings, and building life cycle costs including: simple payback, discounted payback, net-present value, and savings to investment ratio. In addition this tool also displays the environmental benefits of a project.

5. Steam System Energy Conservation Measures

This software requires inputs of simple system inventory information and calculates the energy and cost benefits of various retrofit opportunities. This tool includes energy conservation measures for: fixing steam leaks. This tool calculates energy savings, demand reduction, cost savings, and building life cycle costs including: simple payback, discounted payback, net-present value, and savings to investment ratio. In addition this tool also

# OSTI Strategies/Actions (cont'd)

## Strategy 2 - Enhance Product Cohesiveness and Comprehensiveness

(Addresses OSTI Recommendations 2, 4, and 5)

### Actions

*FY16-17*

- Re-invent software service, integrated with other STI types, in tune with researchers' workflow needs.
- Develop enhanced product/user focus group processes and more granular metrics to understand user behavior within products (e.g., PAGES usability study at UT-ORNL User eXperience Laboratory.)
- Define and implement “unified user environment” as a content environment where diverse but linked forms of STI are seamlessly available.
- Apply numerator/denominator comprehensiveness model to public access.
- Other secondary Actions...

# OSTI Strategies/Actions (cont'd)

## Strategy 3 - Implement Public Access

(Addresses SC Recommendation 1)

### Actions

#### *Completed/Ongoing*

- For all DOE labs, establish FY16 PEMP goal/objective language related to public access support and, specifically, submission of accepted manuscripts.
- For SC labs, establish an FY16 PEMP Notable Outcome, where labs address their progress in public access implementation in their annual plans.
- Follow up with labs/site offices to provide specific guidance and examples of successful implementation.

# OSTI Strategies/Actions (cont'd)

## Strategy 4 - Define OSTI's Role in DOE's Data Landscape

(Addresses SC Recommendation 2)

### **Actions**

*FY16-18*

- Through Lab and community-specific workshops, assess and characterize DOE needs related to the Subcommittee's six suggested roles for OSTI and, with SC approval, integrate the resulting new goals and strategies into OSTI's strategic plan and budgeting/staffing.

# ASCAC STI Summary

Six suggested roles for OSTI in data management:

1. Following the example of major journals and **collecting digital versions of tables, graphs, and images from papers.**
2. Working with all of the Office of Science Programs and the different research communities in the DOE labs to develop **better solutions for linking data and software to publications.**
3. Coordinating reviews of the **data needs by discipline to identify explicit commonalities and differences** between disciplines.
4. Participating in collaborative pilots that **establish the open data and open science end-to-end infrastructures** (data provenance, data workflows, experiment integration).
5. Assisting in the development of an evaluation plan to **assess how well the DMP and OSTI services support the community.**
6. Developing **cost models for manageable and cost-effective data solutions.**

# OSTI Strategies/Actions (cont'd)

## Strategy 4 - Define OSTI's Role in DOE's Data Landscape

(Addresses SC recommendation 2)

### Actions

*FY16-18*

- Through Lab and community-specific workshops, assess and characterize DOE needs related to the Subcommittee's six suggested roles for OSTI and, with SC approval, integrate the resulting new goals and strategies into OSTI's strategic plan and budgeting/staffing.
- Explore providing institutional and operational data management support to the SCWGDD and DOE-WGDD.
- Leverage Data ID Service and E-Link "supplemental material" metadata to enable linking of publications, software, and data.
- Identify and obtain new data and software management skills/expertise.
- Other secondary Actions...



Speeding access to science information from DOE and beyond

Improved visibility of Data ID Service

|      |            |                      |   |                |                 |
|------|------------|----------------------|---|----------------|-----------------|
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DOE Data ID Service – Digital object identifiers for DOE scientific research datasets

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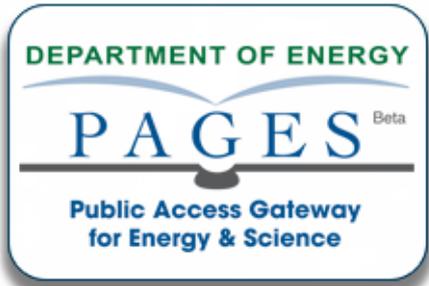
GO

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SciTech Connect  
DOE science, technology, and engineering research information.



DOE PAGES<sup>Beta</sup>  
Public access to DOE-funded peer-reviewed journal articles and accepted manuscripts.



DOE Data Explorer  
DOE scientific research data.

# Conclusions

- OSTI's goal is to be “best in class;” STI Subcommittee's work helps us immensely.
- DOE researcher needs will shape the “unified user environment”.
- Public Access “is an area in which OSTI must be a clear leader to fulfill its mandated responsibilities.”
- OSTI appreciates ASCAC and ASCAC-STI Subcommittee efforts and looks forward to continuing to work with the subcommittee in helping to shape the future of OSTI.



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