CYBER RESILIENT ENERGY
DELIVERY CONSORTIUM

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CREDC Heritage

Beginning

NSF with support of DOE and DHS

Trustworthy Cyber Infrastructure for Power

TCIP: $7.5M

2004

Transition to DOE & DHS

DOE Office of Electricity Delivery and Energy Reliability
DHS S&T, Cyber-Security Division

Trustworthy Cyber Infrastructure for the Power Grid

Cyber Resilient Energy Delivery Consortium

TCIPG: $18.8M

2009

CREDC: $28M

2015

Principal goal

Identify and perform cutting edge research and development that leads to **tools and technology which are actually used** to increase cyber-resiliency of energy delivery systems
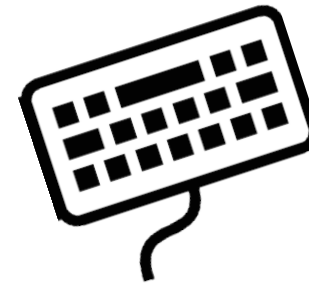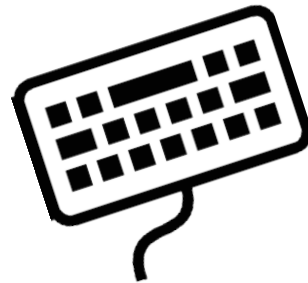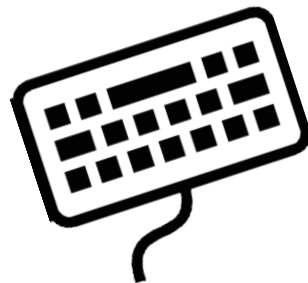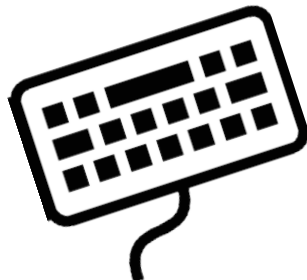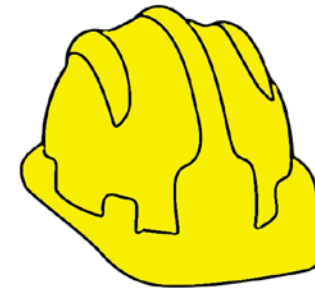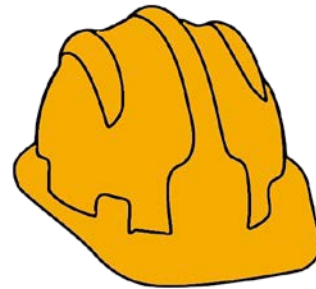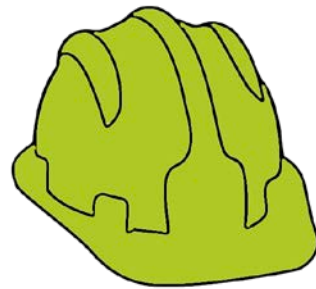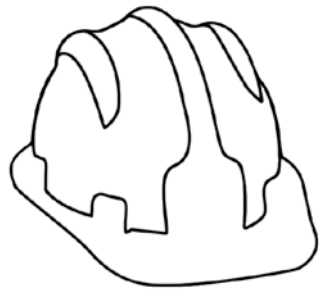
How to get there

- Identify impediments and find highest impact *adoptable* solutions
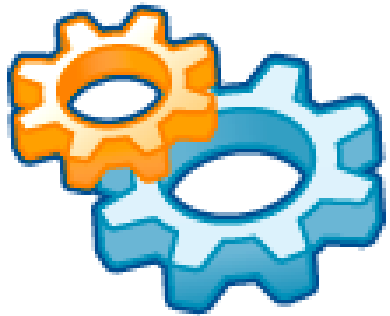
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- Identify impediments and find highest impact *adoptable* solutions
- Develop, validate, verify high impact solutions, with industry
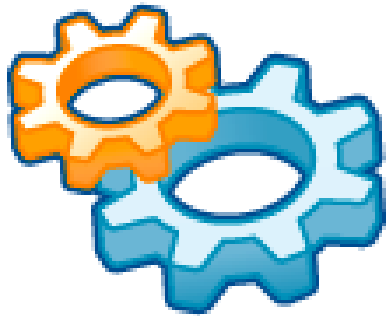
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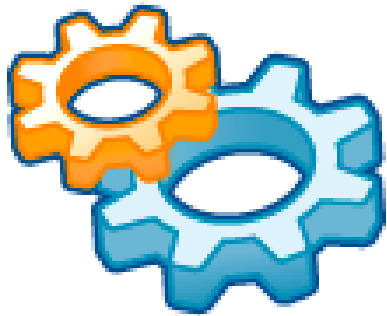- Make solutions available

- Enhance industry awareness of new solutions
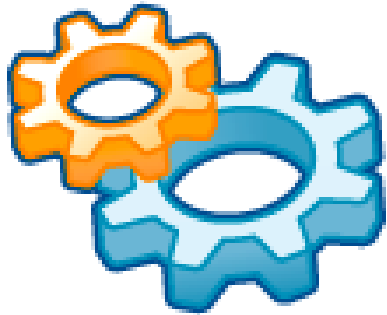
Approach
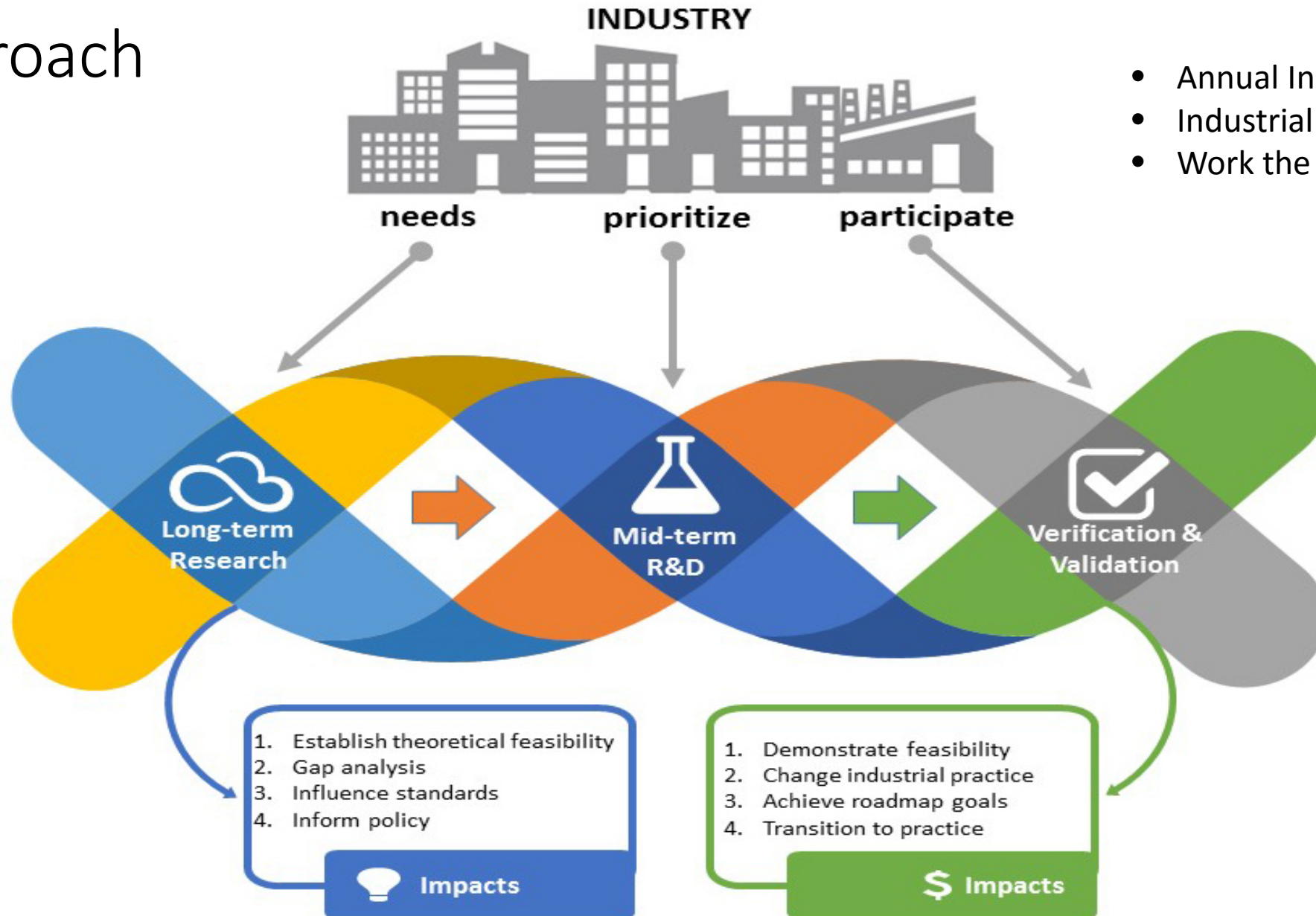
- Annual Industry Workshop
- Industrial Advocates
- Work the network

CREDC Research Areas

- Cyber-Protection Technology
- Cyber Monitoring, Metrics, and Evaluation
- Risk Assessment of EDS Technology and Systems
- Data Analytics for Cyber Event Detection, Management, Recovery
- Resilient EDS Architectures and Networks
- Impact of Disruptive Technologies on EDS
- Validation and Verification

CREDC Statistics 2016

- Approximately 20 publications *per quarter*

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- 13 Internships in 2016

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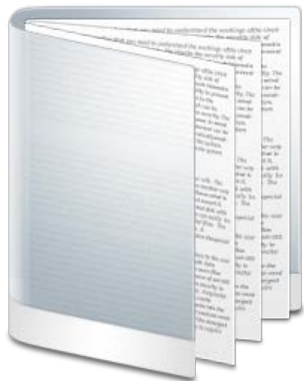- On average 12 presentations *per quarter*
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CREDC Statistics 2016

- Approximately 20 publications *per quarter*
- On average 12 presentations *per quarter*
- 13 Internships in 2016
- 13 graduations in 2016
- 3 reports
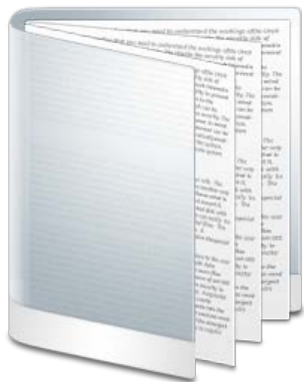
Examples of Industrial Engagement

- Riverside Public Utilities is providing full access to streaming μPMU measurements to ASU
  - Supports research in anomaly detection
- Dartmouth & UIUC working to augment work of Automatak in CES21 program
  - Lightweight authentication / crypto for remote substations
- Siemens supports Rutgers development of security tools for PLCs
- IBM supported UIUC internship and then RA on predictive analytics for wind generation
- ODU collaborative agreement with ReliabilityFirst
  - Developing metrics to evaluate cyber-resiliency of bulk power systems

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- Discuss current challenges in EDS cyber-security
- Discuss how the industry / academic partnership can best work

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  - Cyber supply chain provenance and protection
  - Engineering secure EDS
  - PKI in current and emerging EDS

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Listen, Discuss, Engage