External Needs Assessment Process

Clare Allocca
Director, External Needs Assessment
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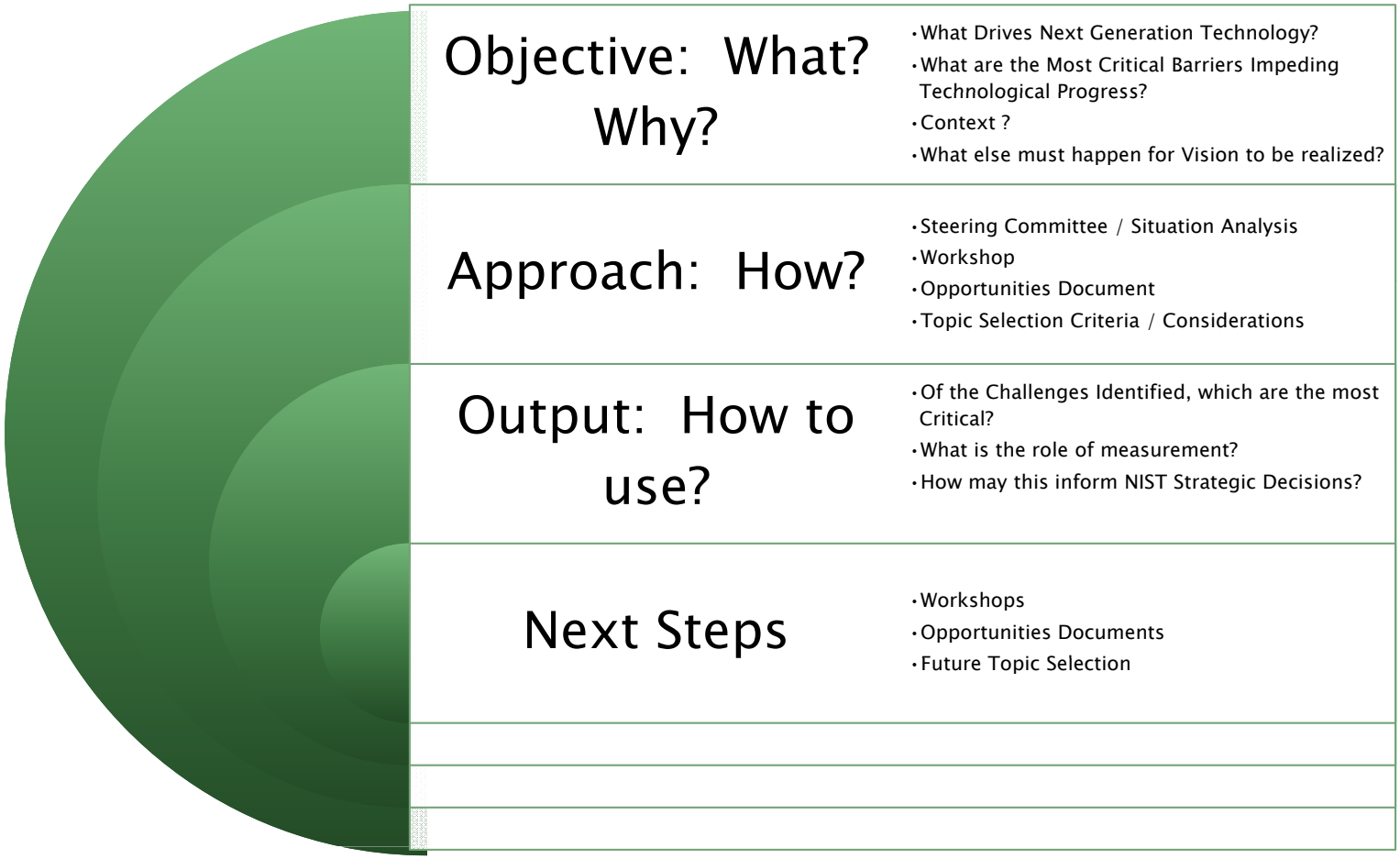
Today


Objective: What? Why?
What Drives Next Generation Technology?
What are the Most Critical Barriers Impeding Technological Progress?
Context ?
What else must happen for Vision to be realized?
Approach: How?
Steering Committee / Situation Analysis
Workshop
Opportunities Document
Topic Selection Criteria / Considerations
Output: How to use?
Of the Challenges Identified, which are the most Critical?
What is the role of measurement?
How may this inform NIST Strategic Decisions?
Next Steps
Workshops
Opportunities Documents
Future Topic Selection

NIST Motivation / NIST Director Charge: What is the Challenge?

Credible Identification of Stakeholder Needs

- NIST requires external input to support its strategic decision making
  - Earlier and Broader Involvement of Customers and Stakeholders
    - Future Priorities and Challenges
    - Lay Out External Drivers / Opportunities
- NIST must ensure that its R&D portfolio is aligned to address the most relevant measurement challenges

Objective / Approach

- **Objective**: Produce credible studies to lay out opportunities/challenges for NIST in a critical technology areas
  - Present External Drivers for NIST Programs

- **Approach**: Implement a workshop / report mechanism to present priorities in the eyes of Key Customers / Stakeholders

Initial Focus Areas
- Advanced Solar Energy
- Climate Change

External Needs Assessment Series

Pre-Workshop
Situation Analysis

- Externally-driven steering committee
- Key Players/Roles: Industry, Academia, Government
- Scan technology documents, roadmaps, measurement needs, market studies, policy/regulatory information…

Workshop

- Assess current SOA (using *Situation Analysis* as basis)
- Identify critical needs
- Identify grand challenges

Post-Workshop
Opportunities Document

- Externally release ***Opportunities Document***
- NIST entities may use as basis for technical planning activities

Key Questions for Workshop Participants

- What are the external drivers to technological innovation and associated economic impact?
- What is the SOA / trend of current technologies? Domestic? International? Competing technologies?
- What is holding back current and/or future generation products from the marketplace?
- Where are the most critical technological/measurement challenges?
- Assuming that timely measurement solutions are provided, what else has to happen to realize the economic impact?
  - What are the chances of these other activities?
  - How much control and/or influence does NIST have over them?

Example Considerations Used When Selecting Workshop Topics

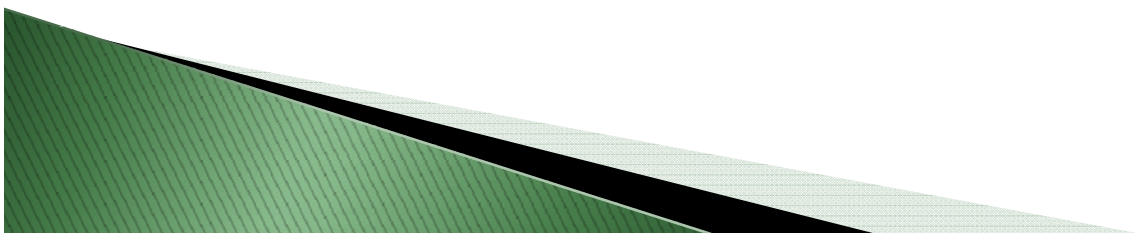
- President's Management Agenda
- NIST and DOC Strategic Plans
- External Recommendations
- Existence of a viable NIST champion
- Ability to define topic
- Potential for NIST commitment to topic
- Potential Impact
  - Economic (Cost / Benefit)
  - Level of Innovation
  - Quality of Life
- "Expected Value"
  - Potential Impact x chance of Realization (i.e. Payoffs and risks)
- Unique Capabilities of NIST to meet Demand
- Existing evidence of importance of measurement
- Uncertainties (e.g. competing technologies, risk, competitiveness issues, infrastructure, International Issues…)

Potential Future Topics

- Battery Technology
- Energy Storage
- Forensics
- Wind Energy
- Manufacturing Robotics and Intelligent Automation
- Advanced Printing
- Complex Infrastructure Networks
- Energy Efficiency
- Sustainability and Advanced Materials

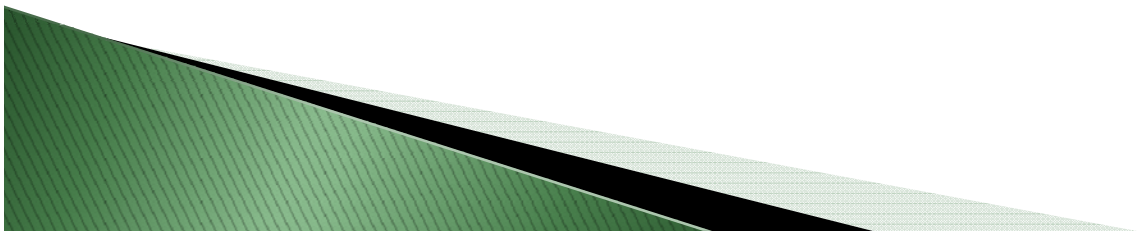
Key Questions

- Future Topics
  - How do we Know these are the Best Topics?
    - What are the criteria for selecting potential topics
  - How do we Ensure that Final Scope has the most Potential?
  - How do we Know these are the Right People ("Rock Stars")?
- What are the "Right" Questions for Workshop Participants?



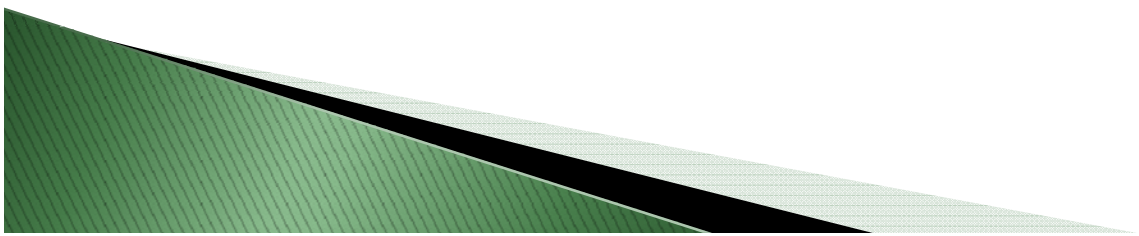
How will Results be Used?

- Externally:
  - Provides broader R&D community with a credible documentation of technological challenges and barriers to innovation in critical technological areas
- Internally:
  - Informs NIST strategic and programmatic planning
  - Provides stakeholder justification for future NIST programs
  - Integrate into NIST-level activities as they develop



Next Steps?

- Selection of FY11 Topics
- Varying Levels of External Needs Assessment Activities?
  - Level One: Full Workshop and Opportunities Document
  - Level Two: Smaller “Café(s)” to Explore Less Defined Topics



Potential Timeline

- External Steering Committee would become a "working group" reporting to the VCAT
- The *Opportunities Document*, addressing external drivers, barriers, and recommended research directions (including, but not limited to measurement-related) would be composed by the "working group" and released by the VCAT
  - *Advanced Photovoltaics* (PV)
  - *Greenhouse Gas Quantification and Verification* (GHG)
- June VCAT Meeting
  - PV: preliminary workshop summary
  - GHG: extremely preliminary workshop summary
- June – September
  - PV and GHG steering committees would communicate to VCAT regarding their progress, and opportunities may be provided for those VCAT members who wish to be more involved
- October VCAT Meeting
  - Both topics would have a draft of the *Opportunities Document* available for discussion
- *Opportunities Documents* released by VCAT in late fall