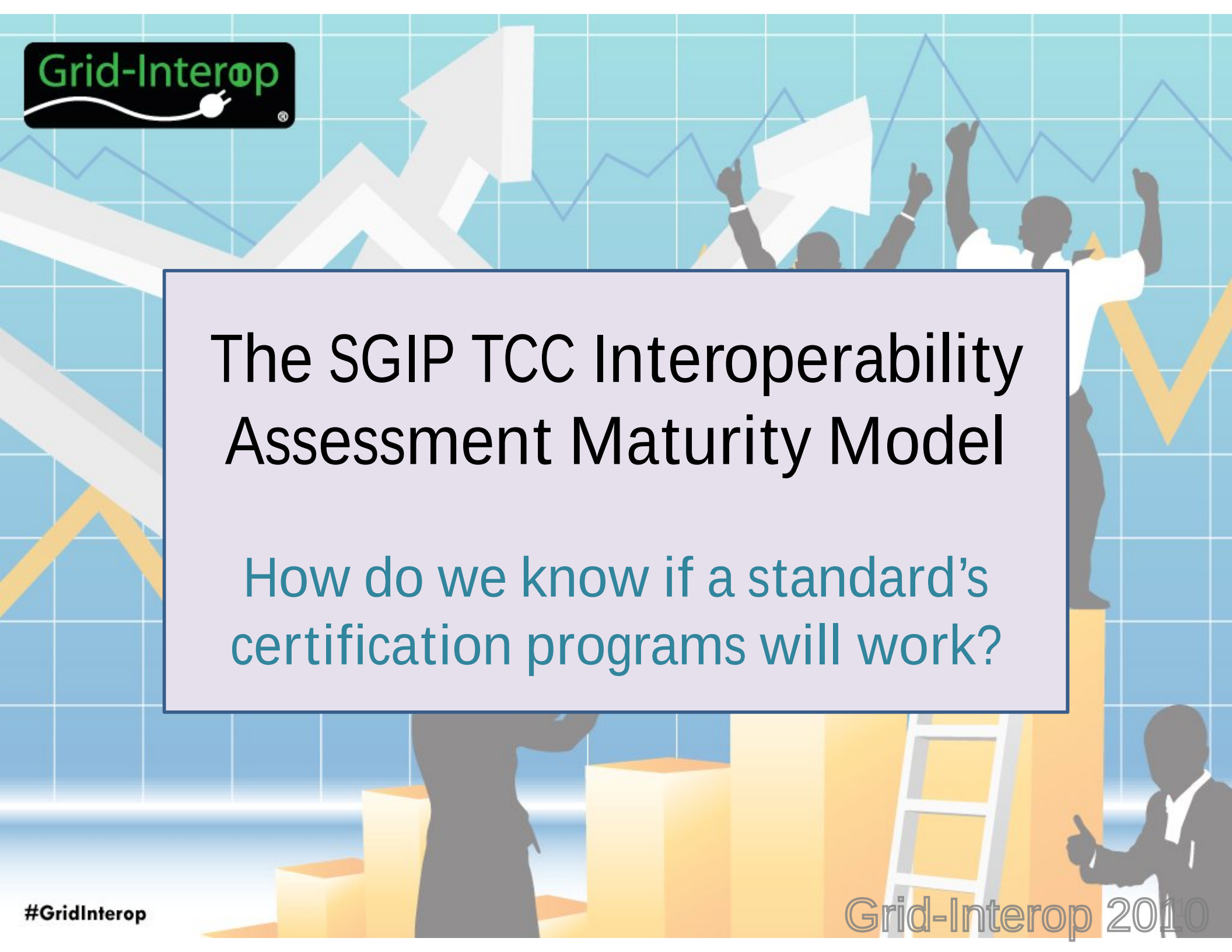

The SGIP TCC Interoperability Assessment Maturity Model

How do we know if a standard's certification programs will work?

Agenda

- The problem defined
- SGIP TCC approach
- Interoperability Maturity Assessment Metrics
- Collecting maturity metric information
- The meaning of the assessment
- What next?

Acknowledgements

- SGIP TCC WG 3 members
  - Especially Pete Cain of Agilent for all the work with scoring and the spreadsheet
- EnerNex work on Conformity Landscape
  (http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/SGIPDocumentsAndReferencesSGTCC)

Member	Organization	Assignment
James Mater	Quality Logic	Chair
John Adams	Honeywell Controls	Co-Chair:
Thomas Farese	Telcordia	
Osmand Sakr	NTS	
Mark Engstrom	NeuStar	
Kent Dickson	Tendril	Co-Chair:
Pete Cain	Agilent	Scribe:
Bruce Muschlitz	EnerNex	
Mark Ortiz	Consumers Energy	
Rudi Shubert	IEEE	
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Rik Drummond	Drummond Group	TCC Chair
Clint Powell	Powell Wireless Commsulting	
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Mladen Kezunovic	Texas A&M	

The SGIP TCC Challenge

- Establish an industry standard process for how to design and manage test and certification programs (TCPs) for a Smart Grid standard
  - NONE EXISTS today!
  - Wide variation in Smart Grid standards: low-level communications protocols (ipv6) to application software interface definitions (OpenADE)
- Gain cooperation of TCP owners for Smart Grid standards
- Assess maturity of different TCPs
- Influence changes to improve TCPs (including establishing new ones)

The SGIP TCC Approach

- Develop an "Interoperability Maturity Assessment Model" (IMAM) for Standards' Test and Certification Activities
  - Use IMAM to develop a Maturity Assessment Questionnaire
  - Apply as a screening and measurement tool
  - Prioritize TCC actions with each standard
- Develop an "Interoperability Process Reference Manual" (IPRM) as a guide to best practices for TCPs
- Assess TCPs against the IPRM
- Use IPRM assessment to
  - Identify areas for improvement and assistance
  - Determine recommended list of "mature" standards test programs
  - Determine priority for assisting TCPs
- Organize an SGIP Test Action Plan (TAP) team to work with priority TCPs

TCP Assessment Issues

- The indicators and causes of such issues will vary considerably as will the remedies that should be applied.
- Agreement on best practices among standards test and certification programs that will produce in-the-field interoperable and interchangeable products
- Flexibility to apply across a broad range of standards types
- Finding objective reviewers to conduct maturity assessments.
- Avoiding political efforts to change the assessments
- Re-assessment after a certain period when a TCP has made progress
- Deciding what is threshold for "certifying readiness of standards for cyber security validation, interop and conformance testing."

Near-Term Goals

- Identify several candidate Smart Grid standard test programs (from the NIST “A List”) that can/will meet our requirements for interoperability /conformance program quality
  - Program needs to be in place.
  - Program needs to meet SGIP criteria for maturity
- Conduct maturity assessments and apply the results to determine TCC actions and priorities
- Identify several candidate standards that could benefit from SGIP assistance in setting up or improving TCPs
- Develop some form of “approved” list for standards that meet (or provisionally meet) SGIP TCC requirements

IMAM

- The “Interoperability Maturity Assessment Model”
- 4 “Filter” Metrics: 8 “Assessment” Metrics
  - Filters – critical characteristics for success
  - Assessments – deeper evaluation of specific strengths and weaknesses of a program
- Already used as a pilot and preliminary assessment for Smart Grid standards test and certification programs

Filtering Metrics

	Interoperability Process Management Organization (ITCA)	Yes	Planned	No
	Technical Specification Structure	Yes	Planned	No
	Product Development and Deployment Status	Yes	Planned	No
	Customer Experience	Yes	Planned	No
	Customer Maturity and Discipline	Yes	Planned / Some do	No
	Conformance, Interoperability and Security Testing	Yes	Planned	No
	Common Questions for all Certification Programs			
	Conformance Testing			
	Interoperability Testing			
	Security Testing			
	Security Evaluation of The Standard	Yes	Planned	No
	Published Test Procedures/Reference Implementation	Yes	Planned	No
	Independent Test Labs	Yes	Planned	No
	Feedback to Standard	Yes	Planned	No
	Conformance Checklist	Yes	Planned	No
	Supplemental Test Tools and Test Suites	Yes	Planned	No
	Sustainability of Test Program	Yes	Planned	No

Filter Metric 1: ITCA

- *Does the SSO Have an ITCA?*
- Or ITCA = *Interoperability Test and Certification Authority*
- To the extent that a strong, well-supported, independent organization exist which can define, administer and maintain a formal certification program, the value of the program and resulting interoperability will improve.
- An ITCA is responsible for
  - specifying test and certification requirements,
  - defining the programs,
  - selecting and certifying labs or test organizations,
  - managing the certification requirements,
  - etc.

GREEN: ITCA is functioning and achieving goals

YELLOW: ITCA exists but with marginal results

RED: No ITCA exists or is operating

Filter Metric 2: Technical Specification Structure

- A look at the SDO/SSO technical specification or guide for a standard, if one exists, can help assess the likelihood that an ITCA will be successful in developing and managing a test and certification program.
- For instance, best practices for technical specifications include:
  - A specific conformance section in the specification facilitates test and certification.
  - Few options or private extensions will make it easier to develop test and certification programs for than standards that have a significant number of optional features and functions.
  - Thorough and clear specification can make implementing an interoperable product easier than an incomplete or ambiguous specification.

GREEN : Structured to support interoperable products

YELLOW: Numerous options and extensions without adequate interoperability guidelines

RED: Poorly structured, ambiguous

Filter Metric 3: Product Development Status

- Are products being delivered claiming conformance to a specific standard? Are customers attempting to implement such products?
- A "No" means it is premature to judge the effectiveness or maturity of a standards interoperability test or certification program.
  - This does not prevent evaluating other characteristics of the standards activity but the fewer the products in the market the more important the value of the Assessment.

GREEN: 2nd generation products are in the field

YELLOW: Products are in evaluation but not shipping

RED: There are no products in development

Filter Metric 4: Customer Experience

- (Customers for products built to a standard)
- What experience are customers having with the products as far as interoperability is concerned?
  - What are the customer expectations for interoperability? Are they being met?
  - How severe are the issues in terms of effort to deploy? Are they actually preventing deployment or changing the deployment strategy to accommodate the problems?
  - Do the issues prevent substitution of one vendor's product for another?
- Products are either meeting interoperability expectations of customers or not.

GREEN: Products in use, few interop problems

YELLOW: Some interop problems encountered

RED: Significant interop problems in the field

Data Collection

- Questionnaire: 120 questions across the 12 metrics
- Yes/No/Next Six Months/NA responses
- Excel spreadsheet that automatically computes ratings on each metric
- Scoring
  - < 25% YES – RED traffic light
  - 25% - 75% - YELLOW traffic light
  - > 75% YES – GREEN traffic light
- Collaborative assessment initially (2-3 hours)
- Likely to become self-administered tool to prepare for IPRM assessment

Questionnaire Sample

	Customer Maturity and Discipline	Yes	Planned / Some do	No	N/A	Comment or supporting evidence
1	Do Requests for Products (RFPs) typically include requirements for conformance and interoperability certification to the relevant standards?					
2	Are customers aware of a certification or other interoperability validation program?					
3	Do they judge it to provide value?					
4	Are they requiring a certification of some sort by an independent 3rd party prior to consideration of new technology in the market?					
5	Are customers independently verifying interoperability claims of vendors?					
6	For this standard, does it make sense that products from different vendors for the same application can be substituted for one another without the need for specialized software or integration efforts?					
7	If yes to 7, do customers require that there are at least two vendors for products that provide comparable functionality?					

Summary level view

●	Interoperability Process Management Organization (ITCA)	Yes	Planned	No
●	Technical Specification Structure	Yes	Planned	No
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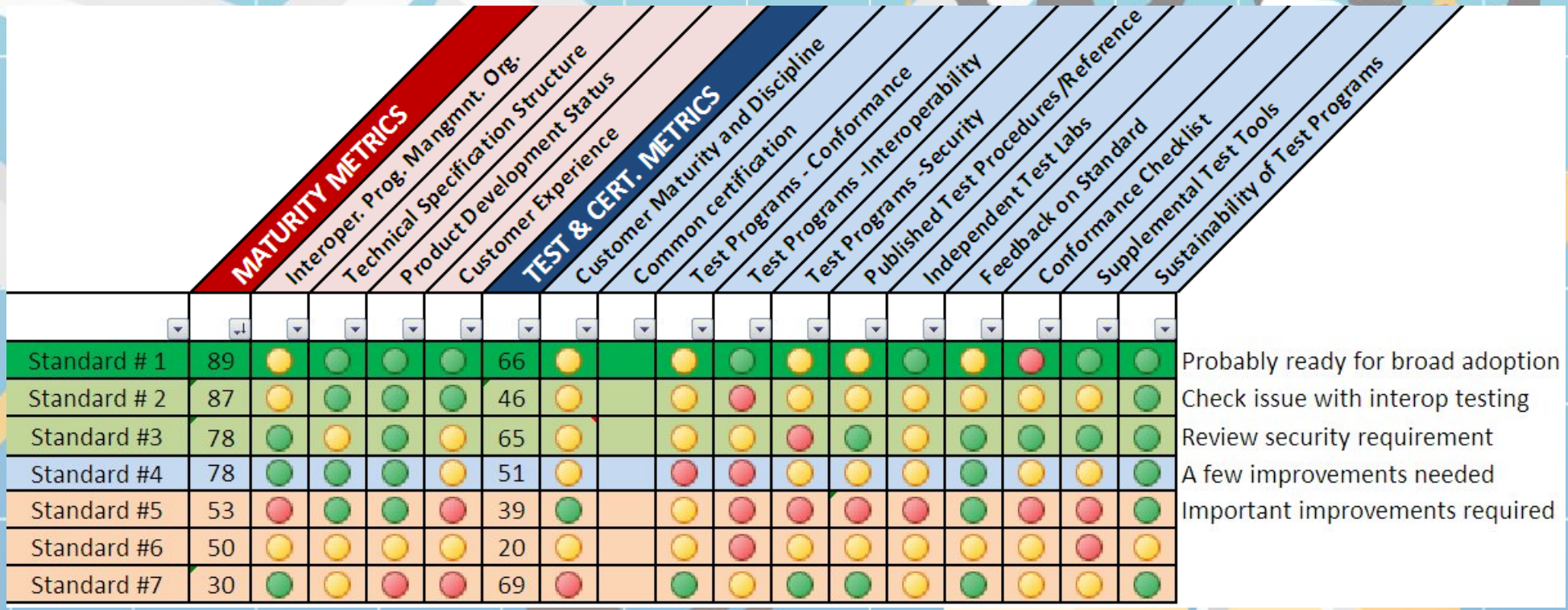
Traffic Light Example



What Does the Maturity Assessment Mean?

- Assessment is high-level, quick look at a standard's text program
- Valuable for:
  - Self-assessment for improvement roadmap
  - TCC assessment for prioritizing actions of TCC
  - SGIP metric to influence "adopted' standards catalog for Smart Grid
- Incentives for test and certification organizations
  - Useful program feedback
  - External benchmarking
  - Data to influence focus and budget on test programs
  - Key factor in achieving "approved" Smart Grid standard status

Status and What Next?

- Status: completed initial product and archived
  - 10+ ITCAs piloted and results compiled anonymously
- Opportunities?
  - Adapt to act as pre-qualification tool for ITCAs planning to complete an IPRM Assessment
  - Use as starting point for a Smart Grid Standard Maturity Assessment Model – add metrics for other aspects of standard maturity

IPRM and IMAM Coverage

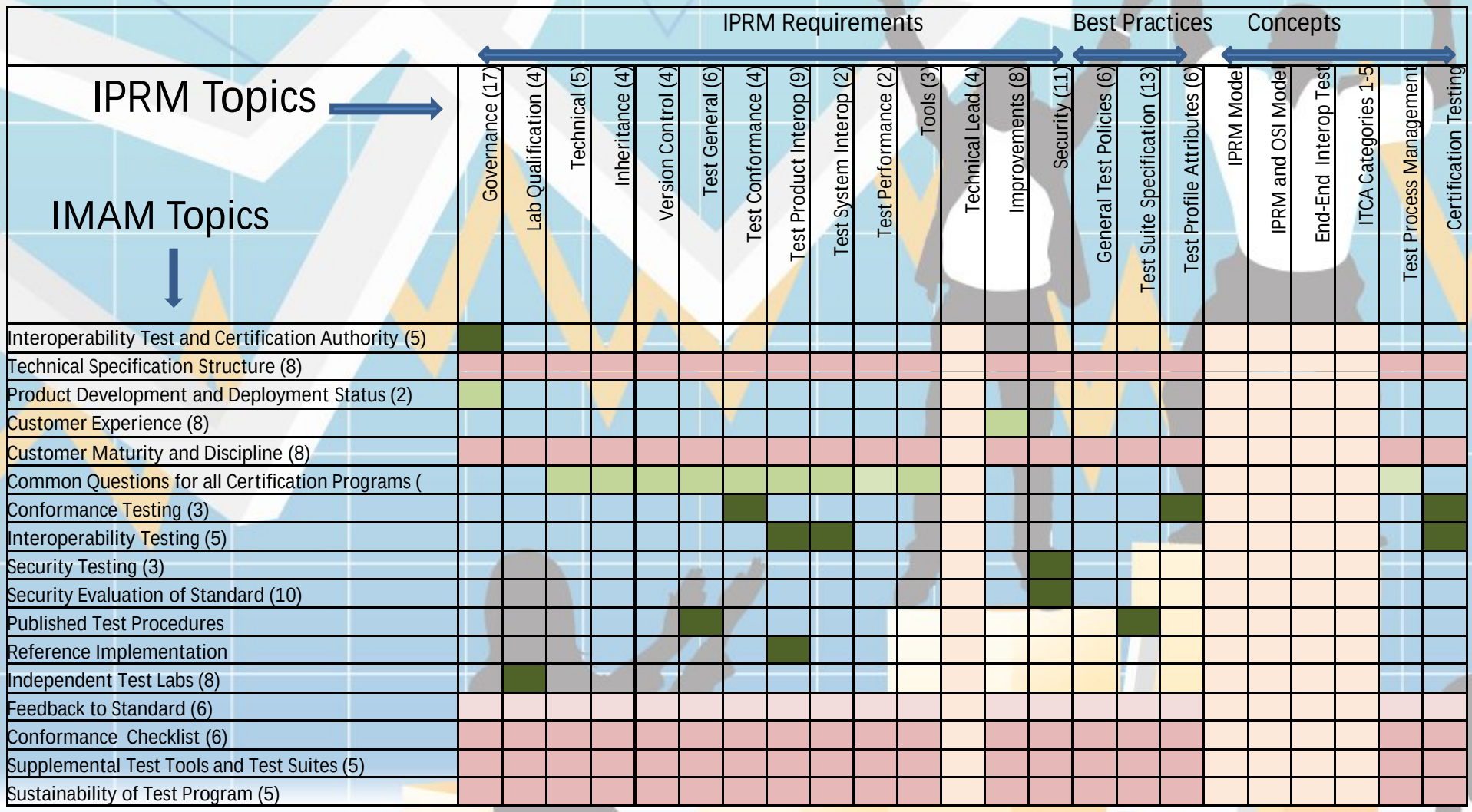
IPRM Topics

IPRM Model
IPRM and OSI Model
End-End Interop Test
ITCA Categories 1-5
Test Process Management
Certification Testing
Governance (17)
Lab Qualification (4)
Technical (5)
Inheritance (4)
Version Control (4)
Test General (6)
Test Conformance (4)
Test Product Interop (9)
Test System Interop (2)
Test Performance (2)
Tools (3)
Technical Lead (4)
Improvements (8)
Security (11)
General Test Policies (6)
Test Suite Specification (13)
Test Profile Attributes (6)

IMAM Topics

Interoperability Test and Certification Authority (5)
Technical Specification Structure (8)
Product Development and Deployment Status (2)
Customer Experience (8)
Customer Maturity and Discipline (8)
Common Questions for all Certification Programs (
Conformance Testing (3)
Interoperability Testing (5)
Security Testing (3)
Security Evaluation of Standard (10)
Published Test Procedures
Reference Implementation
Independent Test Labs (8)
Feedback to Standard (6)
Conformance Checklist (6)
Supplemental Test Tools and Test Suites (5)
Sustainability of Test Program (5)

IMAM and IPRM Coverage



IMAM (x) = number of questions. IPRM (x) = number of requirements

Conclusions

- SGIP TCC developing ground-breaking processes and tools for assessing maturity of standard test and certifications programs
- Tools valuable to
  - standards test programs
  - SGIP
  - NIST
  - Smart Grid industry
- Still in development and test stage
- Future depends on TCC goals in 2011

Resources

- EnerNex “EXISTING CONFORMITY ASSESSMENT PROGRAM LANDSCAPE”, Version 0.82, February 19, 2010
  - LINK AT HTTP://COLLABORATE.NIST.GOV/TWIKI-SGGRID/BIN/VIEW/SMARTGRID/SGIPDOCUMENTSANDREFERENCESSGTCC
- INTEROPERABILITY KNOWLEDGE BASE (IKB) “SGIP CATALOG OF STANDARDS”
  - HTTP://COLLABORATE.NIST.GOV/TWIKI-SGGRID/BIN/VIEW/SMARTGRID/SGIPCATALOGOFSTANDARDS
- The great minds of WG 3!