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The Green Grid, Metrics and DCMM

Presented by: Jay Taylor

About The Green Grid

- A not-for-profit international consortium committed to advancing resource efficiency in business computing ecosystems and achieving bottom-line results
- Develop meaningful, user-centric standards, metrics and tools to help IT and facilities better achieve efficiency and sustainability across the entire data center ecosystem
  - Improving data center efficiency and sustainability is only effective when it is measurable
- Promotion and training about standards, measurement methods, best practices and technologies
- Collaborating with governments and other standards makers around the world

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Over 170 Members Worldwide

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The energy dilemma is here to stay

The facts

×2

Energy demand

By 2050

Electricity by 2030

Source: IEA 2007

vs

The need

÷2

CO_2 emissions

to avoid dramatic climate changes by 2050

Source: IPCC 2007, figure (vs. 1990 level)

Frequent power outages

Rising energy prices

Climate change

Conflicts for resource access & control

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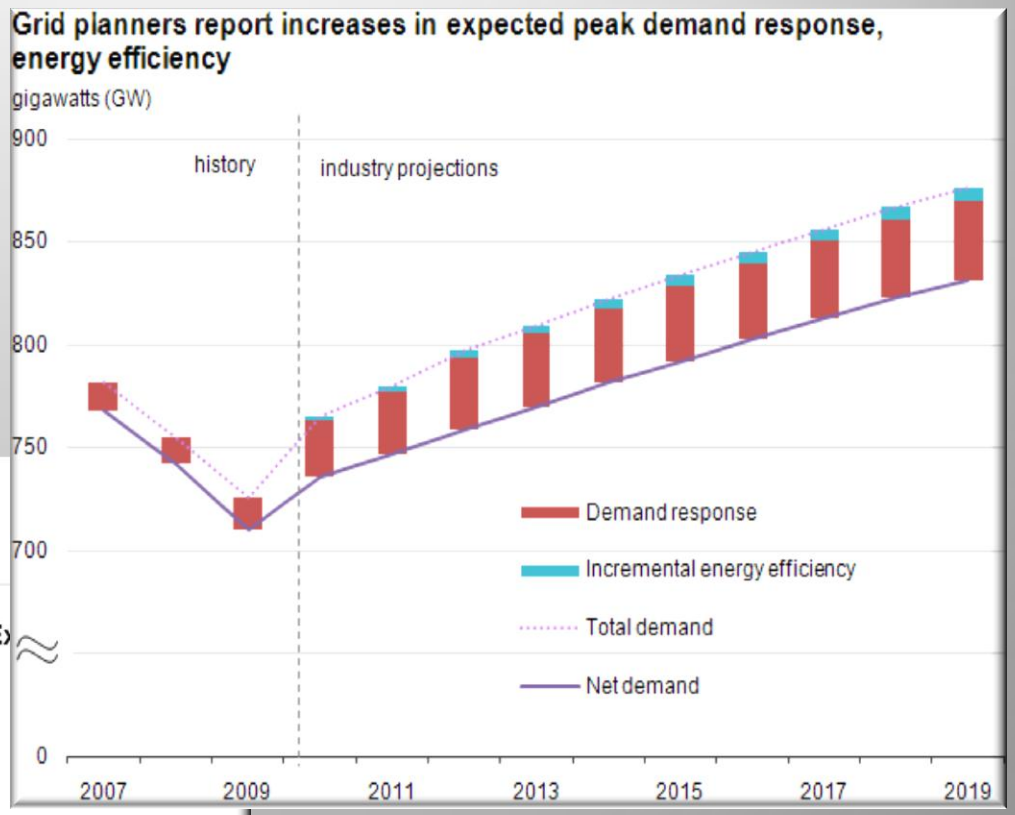
Enough Said?



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Bloomberg Businessweek Thursday February 23, 2012

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Oil Rises to Nine-Month High on Greek Aid Deal, Iran Ex

February 21, 2012, 10:07 PM EST

Tweet 19 Share 5 +1 0 Business Exchange E-mail Print

By Moming Zhou and Mark Shenk

Feb. 21 (Bloomberg) -- Oil increased to a nine-month high after Greece won a second bailout and Iran said it stopped selling crude to France and Britain.

Futures rose 2.5 percent after the euro-area ministers approved 130 billion euros ($173 billion) in aid for Greece by tapping into European Central Bank profits and coaxing investors into providing debt relief, shielding the region from a default. Iran stopped selling oil to the countries yesterday, preempting a European Union ban, an official news website said.

"There's a lot of relief about the Greek situation in the market and Iran is making a lot of noises," said Kyle Cooper, director of research at IAF Advisors, a Houston-based energy consulting company. "The Greek agreement has increased optimism about the economy."

Crude oil for March delivery gained $2.60 to $105.84 a barrel on the New York Mercantile Exchange, the highest settlement since May 4. Futures have risen 7.1 percent this year. The March contract expired at the close of floor trading.

The more active April contract increased $2.65, or 2.6 percent, to $106.25 a barrel on the Nymex. Floor trading was closed yesterday because of the U.S. Presidents Day holiday.

Brent oil for April settlement increased $1.61, or 1.3 percent, to $121.66 a barrel on the London-based ICE Futures Europe exchange, also a nine-month high.

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But Did You Know….?

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Green Grid White Paper #44 on EMEA Data Center Energy Policy

	United Kingdom	France	Germany	Spain	Nether-lands	Italy	Switzer-land	South Africa	Russia	United Arab Emirates	Saudi Arabia	Qatar
EU and International Policy												
Energy Performance of Buildings Directive	✔	✔	✔	✔	✔	✔						
Revisions to the Energy Performance of Buildings Directive	✔	✔	✔	✔	✔	✔						
Mandatory Energy Labelling (e.g., The Energy Labelling Directive)	✔	✔	✔	✔	✔	✔					✔	
EU Ecolabel / Flower	✔	✔	✔	✔	✔	✔						
The EC Code of Conduct on Data Centre Energy Efficiency	✔	✔	✔	✔	✔	✔						
Expansion of the Eco-Design Directive	✔	✔	✔	✔	✔	✔						
Fluorinated Greenhouse Gases	✔	✔	✔	✔	✔	✔						
EU GHG Emission Trading Scheme	✔	✔	✔	✔	✔	✔						
ETSI / CEN / CENELEC Standards	✔	✔	✔	✔	✔	✔						
ISO 50001 and ISO 14001	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
ITU Sustainable ICT Specification	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
EU Energy Star	✔	✔	✔	✔	✔	✔						
Energy Star (US)							✔	✔	✔	✔	✔	✔
Monitoring, Measuring and Reporting	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Mandatory Policies (Building Regulations, Planning and Mandatory Performance)												
Building Regulations Driving Energy Performance	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Strong Planning Policy Driving Low Carbon Development	✔											
Future Mandatory Energy Performance	✔											

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But Did You Know….?

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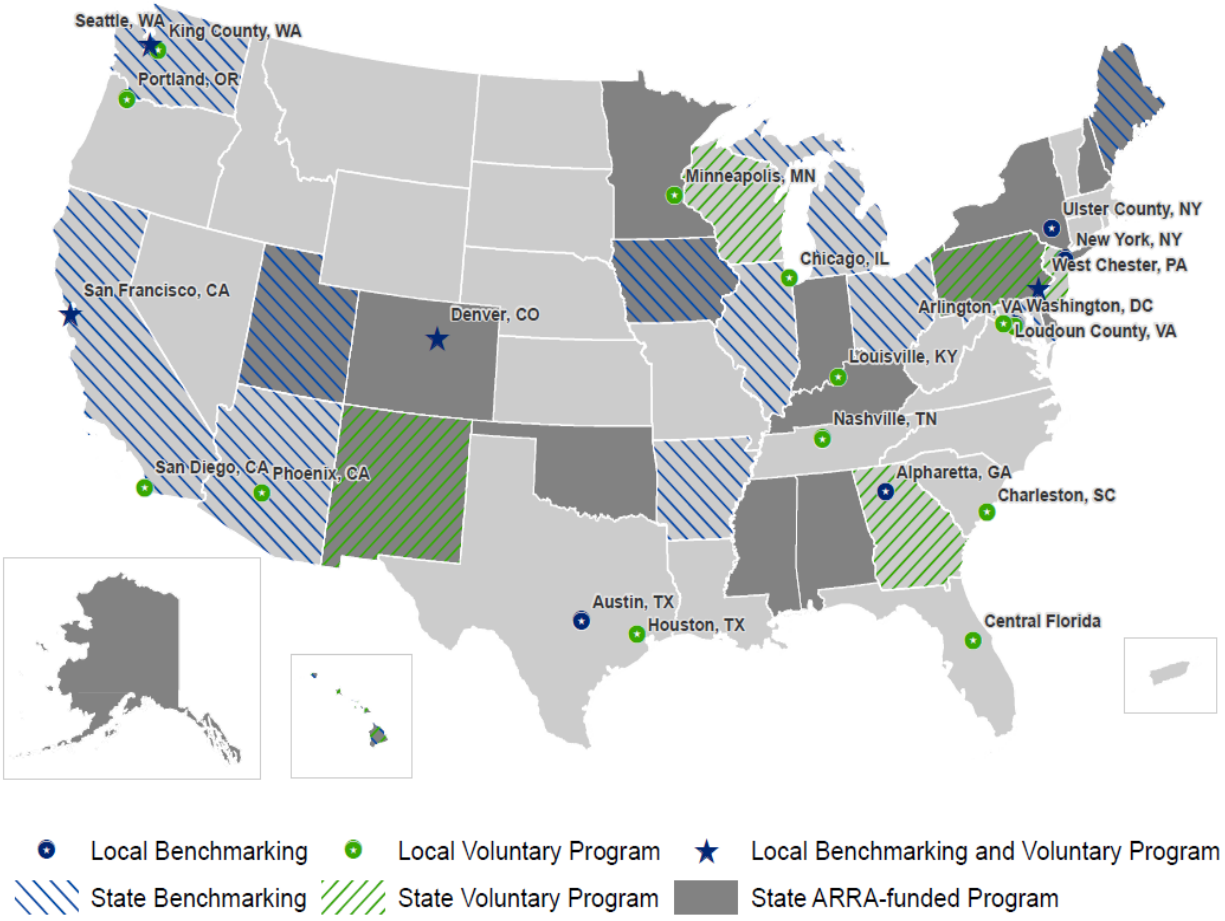

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So How Do I Start?
Assess the Energy Efficiency of Your Data Center

- US EPA Energy Star Data Center Rating System
  - Portfolio Manager
- US DOE Data Center Energy Practitioner Program
  - DC Pro
- The Green Grid
  - Data Center Maturity Model
  - PUE Reporting On-line Tool

Establish your baseline with an assessment and then manage with DCIM

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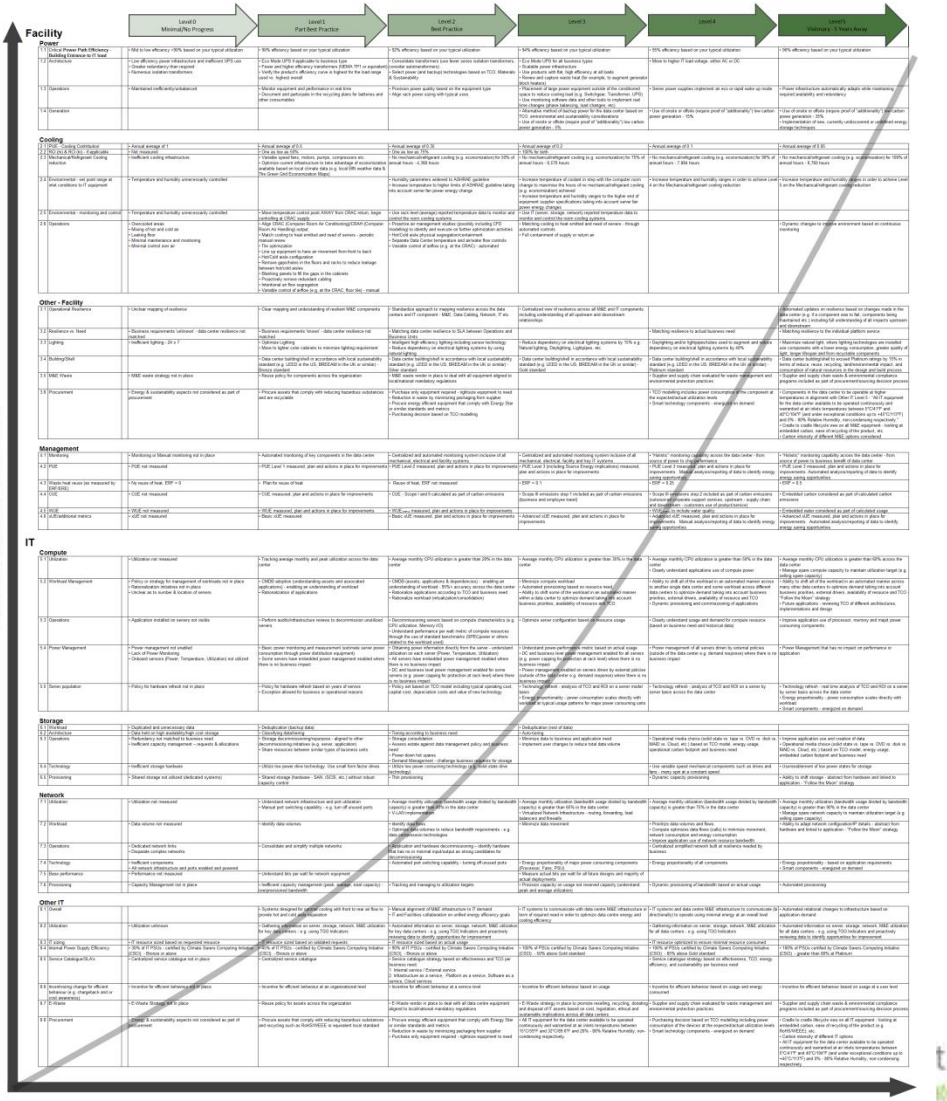
Data Center Maturity Model

- DCMM: A roadmap for the industry to significantly improve efficiency and sustainability through benchmarking data center facility efficiency to clearly show where improvements can be made

- Integrates every aspect of the data center including power, cooling, compute, storage and network

- Provides guidelines by data center area such that operators can benchmark their current performance using the Data Center Maturity Model Equalizer, thereby:
  - Understand how far they are from best practice
  - Identify the ongoing steps and innovations required to achieve greater energy efficiency and sustainability improvements, both today and into the future.
  - Use the higher levels of the model to inform data center and IT strategy.

Data Center Maturity Model



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Structure

- Minimal/No Progress
- Part Best Practice
- Best Practice
- Reasonable Step (between Level 2 and 5)
- Reasonable Step (between Level 2 and 5)
- Visionary – 5 Year View

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Scope Includes

- Energy Efficiency
  - Energy demand
  - Energy supply – low carbon generation
  - Utilization/Effectiveness
- Sustainability
  - Carbon
  - Water
  - Waste heat
  - Materials management
    - E-Waste
    - Cradle to cradle approach – lifecycle
  - Building sustainability
- Monitoring/metrics

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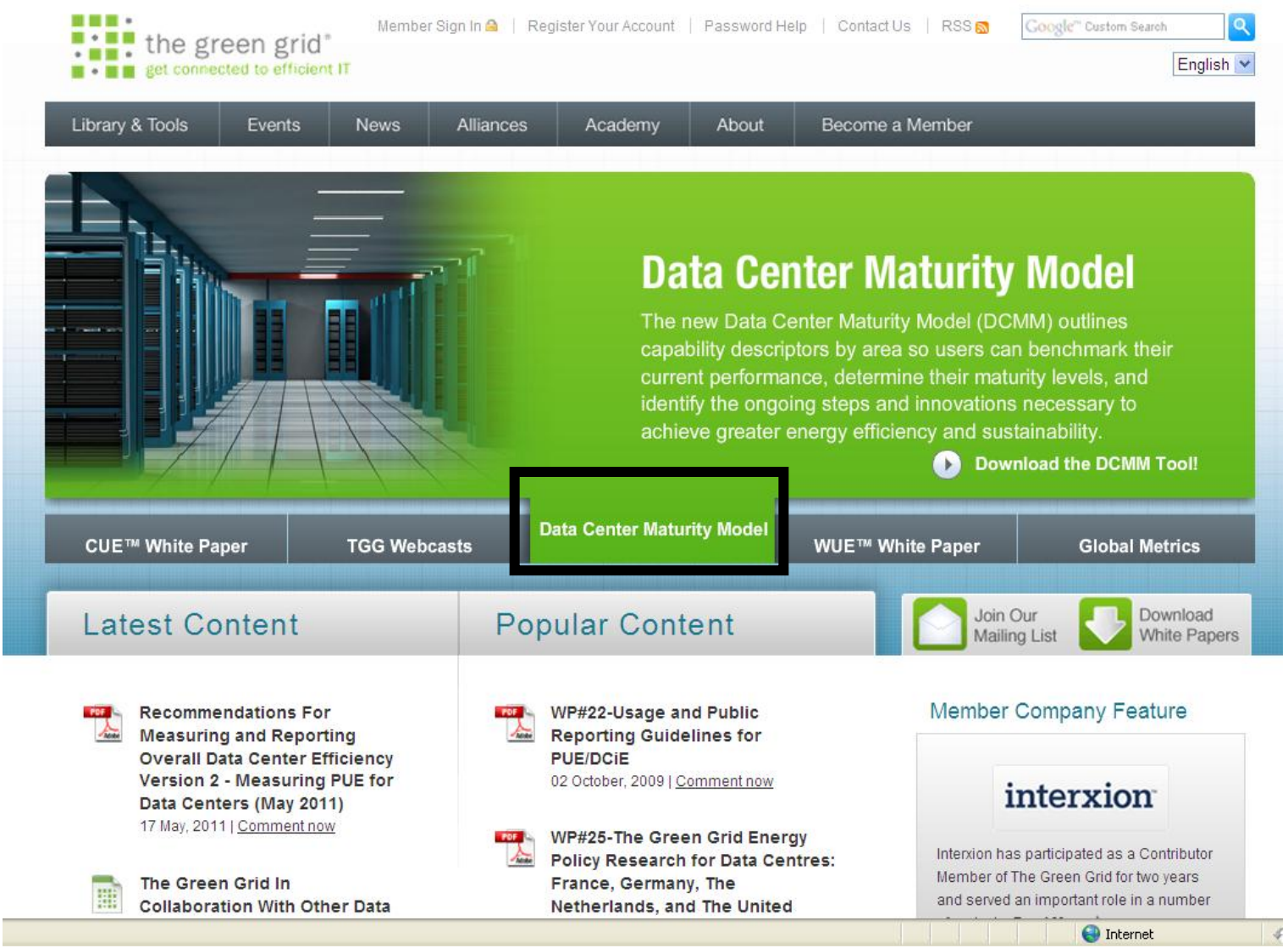
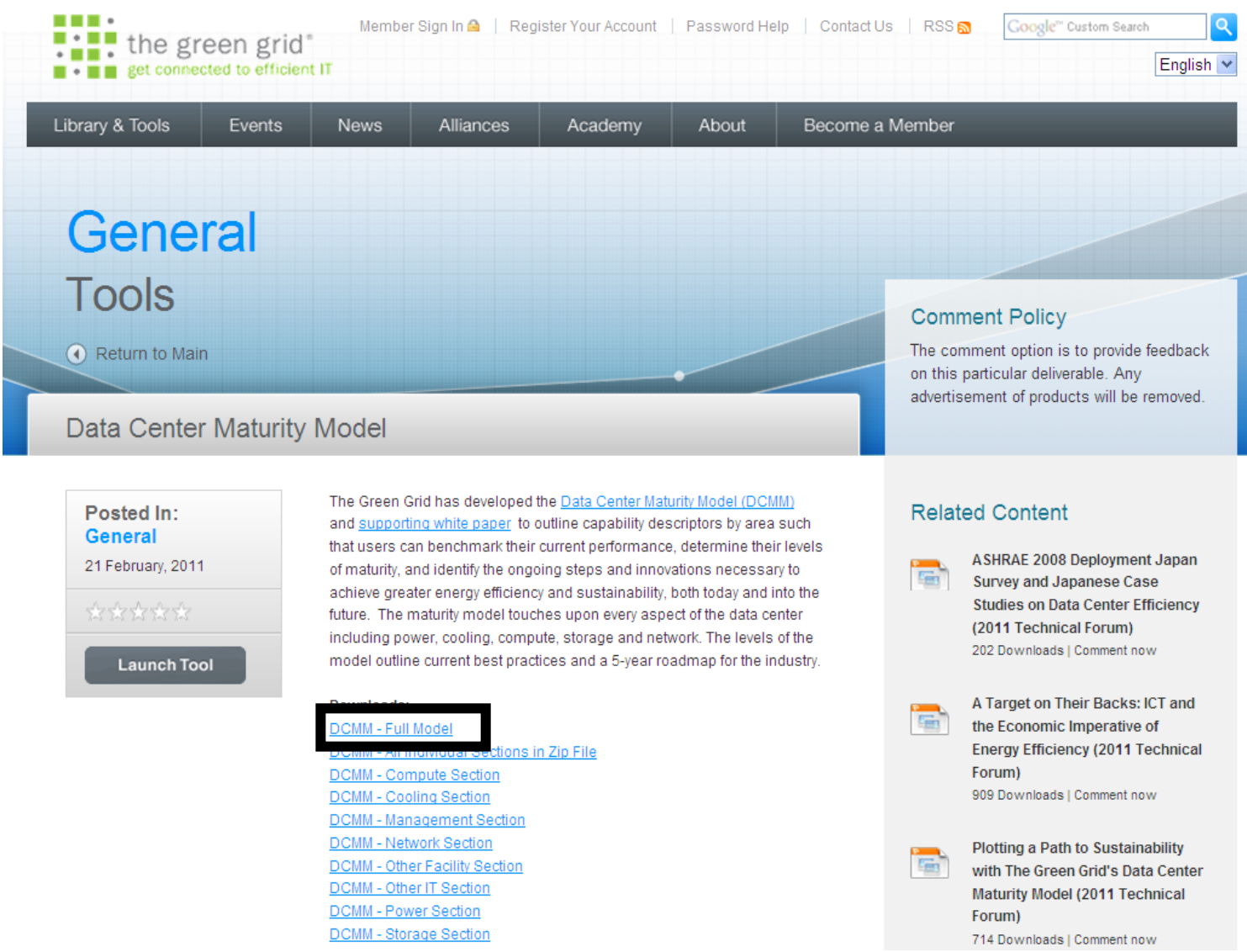
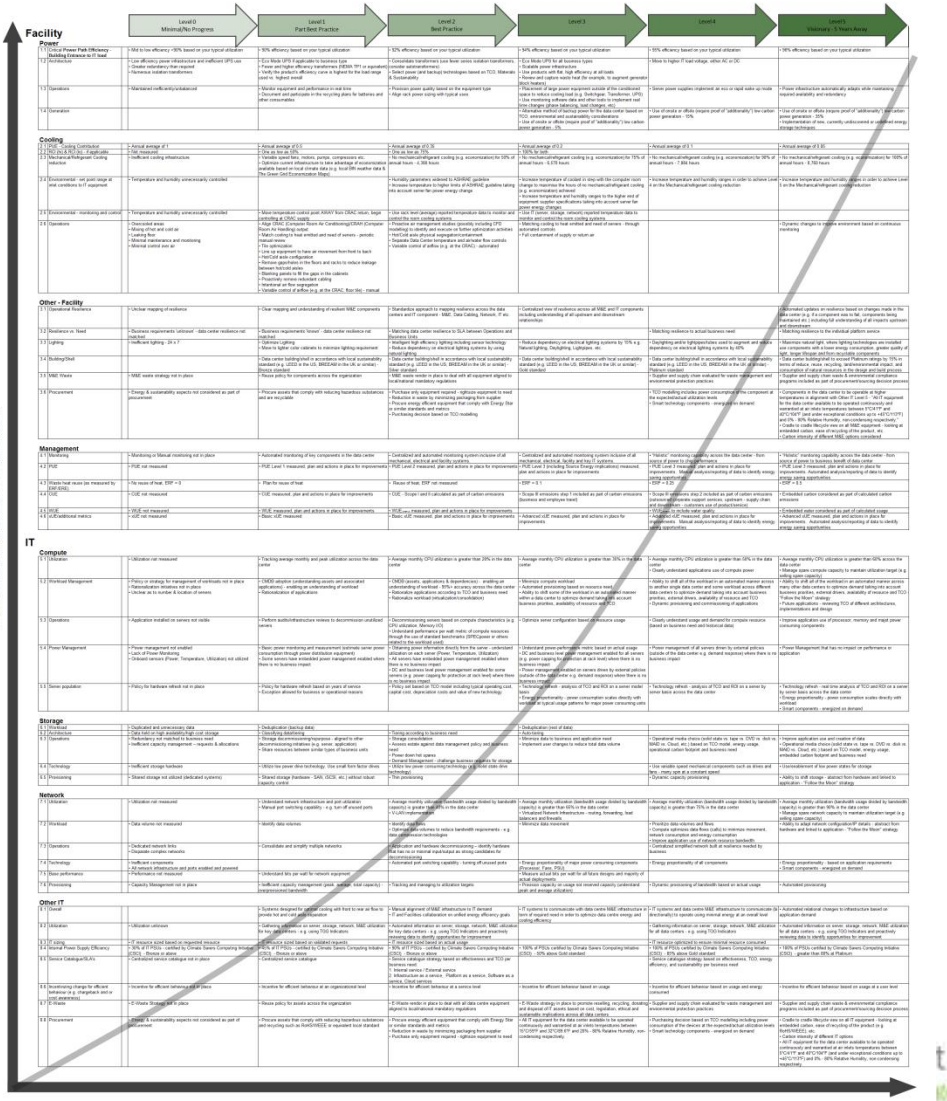
Accessing Online



Library & Tools



Data Center Maturity Model



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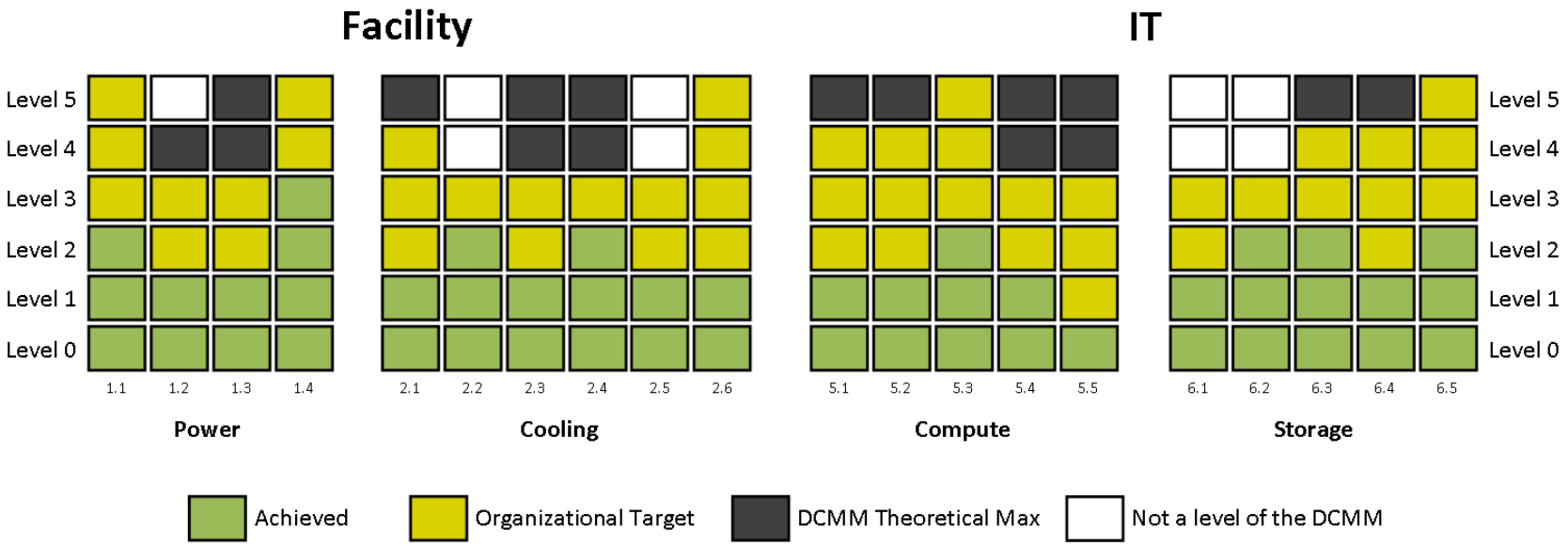
Data Center Maturity Model Equalizer



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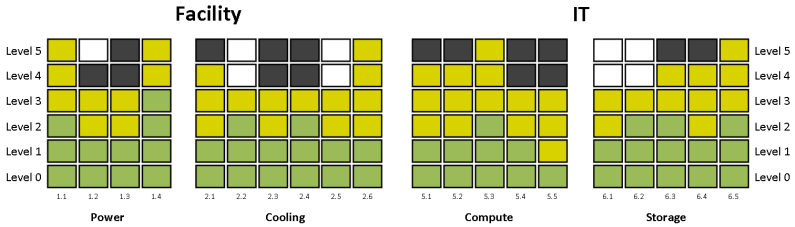
Feedback

Feedback

- Where do I assess myself?
- How do I get the equaliser for my data center?



Also

- Track progress over multiple years for data centers
- Enter a template and create copies
- Export assessment and equaliser
- High level and detailed assessments – depends on time and number of data centers

- Built with only user experience in mind and usable from your mobile device

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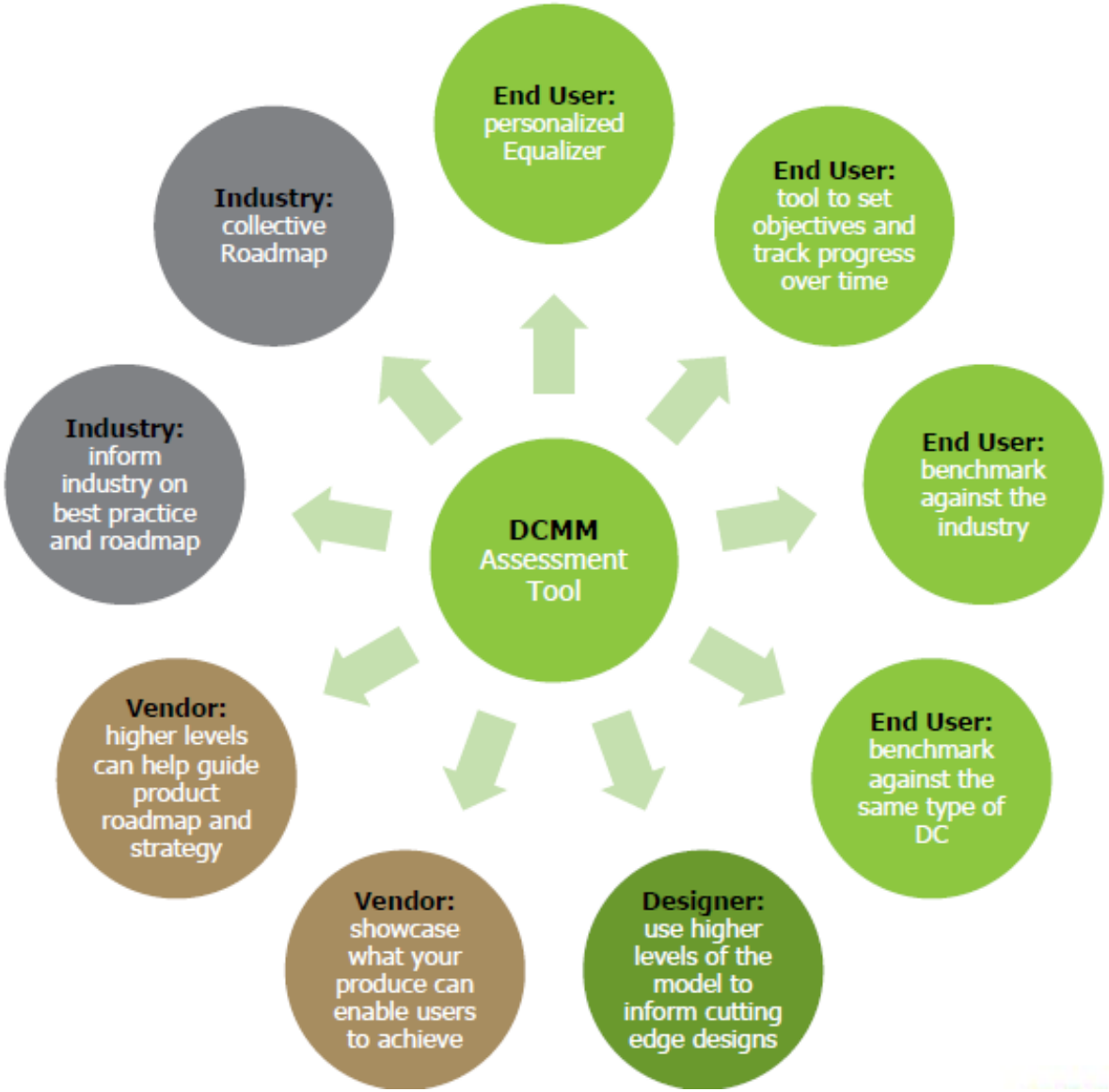
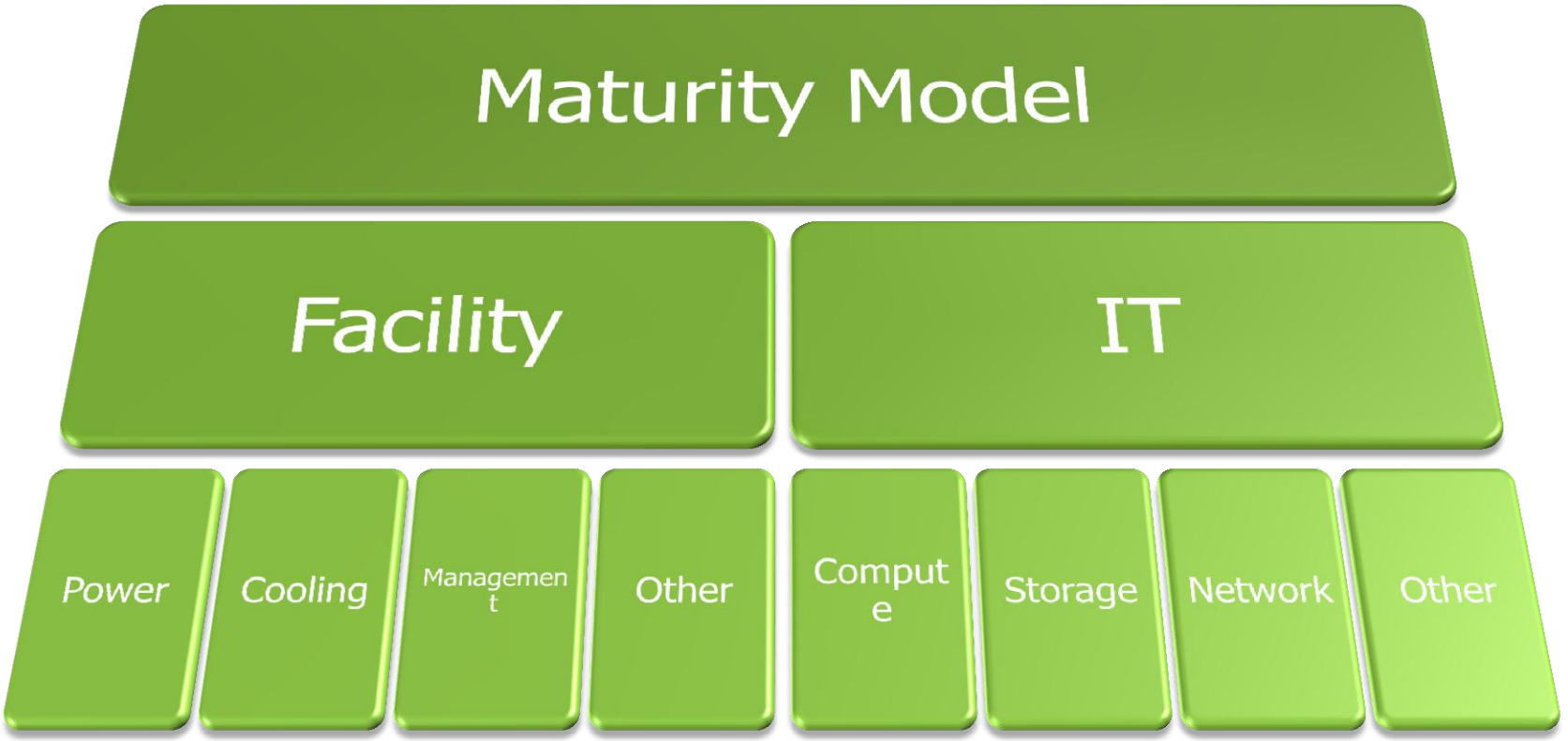
DCMM Stakeholder Use Cases



Content

DCMM Integrates every aspect of the data center for a holistic business approach to efficiency



Facility – Power

- Critical Power Path Efficiency – Building Entrance to IT load
- Architecture
- Operations
- Generation

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Facility – Cooling

- PUE – Cooling Contribution
- RCI (hi) & RCI (lo) – if applicable
- Mechanical/Refrigerant Cooling reduction
- Environmental – set point range at inlet to IT equipment
- Environmental – monitoring and control
- Operations

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Facility – Other

- Operational Resilience
- Resilience vs. Need
- Lighting
- Building/Shell
- M&E Waste
- Procurement

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Facility – Management

- Monitoring
- PUE
- Waste heat reuse (as measured by ERF/ERE)
- CUE
- WUE
- xUE/additional metrics

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IT – Compute

- Utilization
- Workload Management
- Operations
- Power management
- Server populations

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IT – Storage

- Workload
- Architecture
- Operations
- Technology
- Provisioning

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IT – Network

- Utilization
- Workload
- Operations
- Technology
- Base Performance
- Provisioning

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IT – Other

- Utilization
- IT Sizing
- Internal Power Supply
- Service Catalogue/SLA's
- Incentivizing change for efficient behaviour
- E-Waste
- Procurement

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Assessment Tool - Questions

Return to My Assessments Page

Data Center Maturity Model - Site Information

Questions

1	Data Center name :	
2	What country is your data center located :	-- Select --
3	Building classification :	-- Select --
4	What type of data center is your site :	-- Select --
5	What vertical sector is your site in :	-- Select --
6	What is the Tier of your data centre (1-4) :	-- Select --
7	What is the age of your data centre (in years) :	-- Select --
8	Size of your data centre (sq ft) :	-- Select --
9	Annual average PUE :	-- Select --
10	Current measured UPS output (IT load only) :	-- Select --
11	Number of Servers :	-- Select --
12	Age of Servers :	-- Select --

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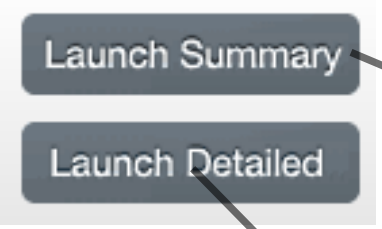
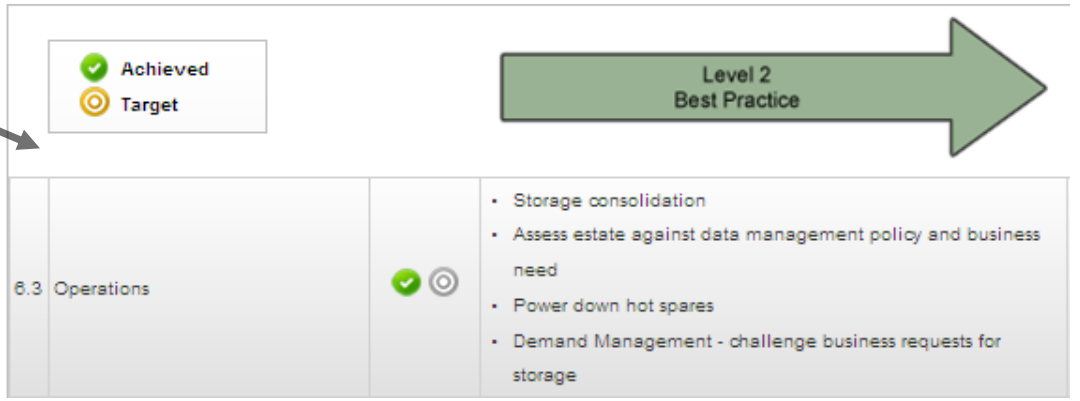
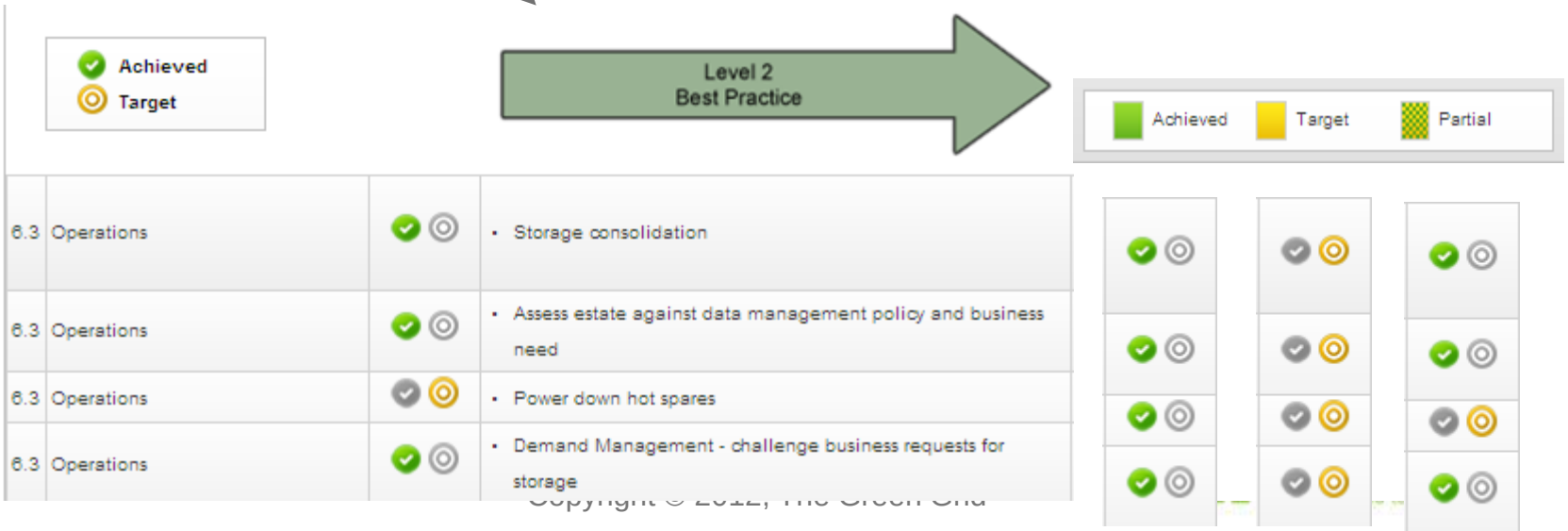
Assessment Tool - Summary or Detailed







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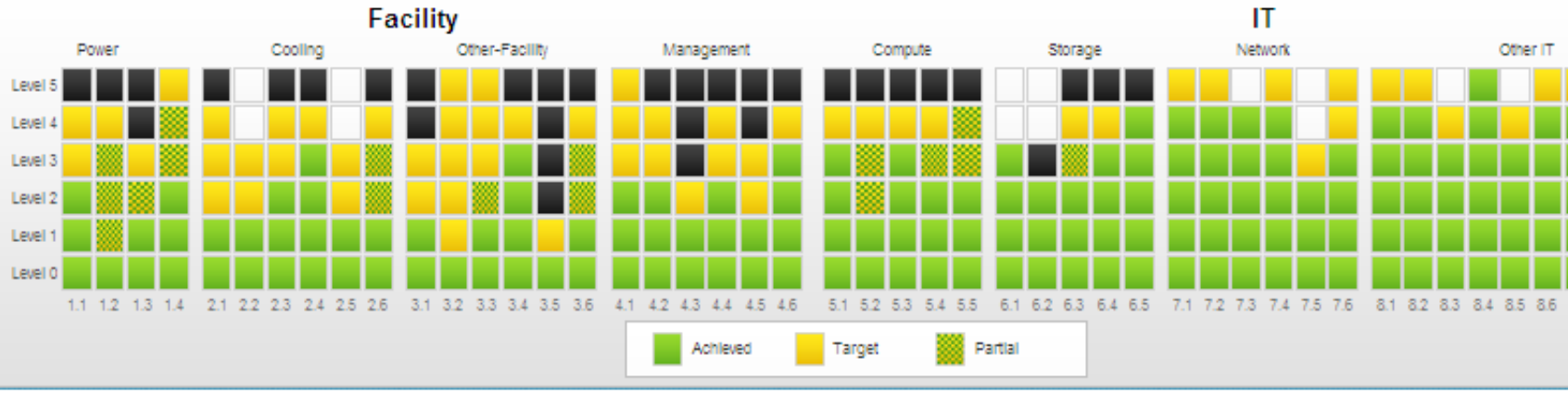
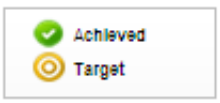
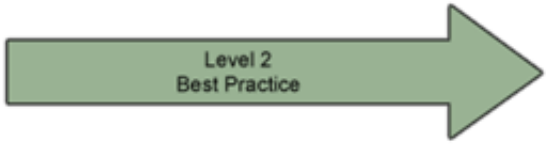
Facility | Power | Cooling | Other-Facility | Management | IT | Compute | Storage | Network | Other IT

Data Center Maturity Model - Detailed Assessment (Carolina)





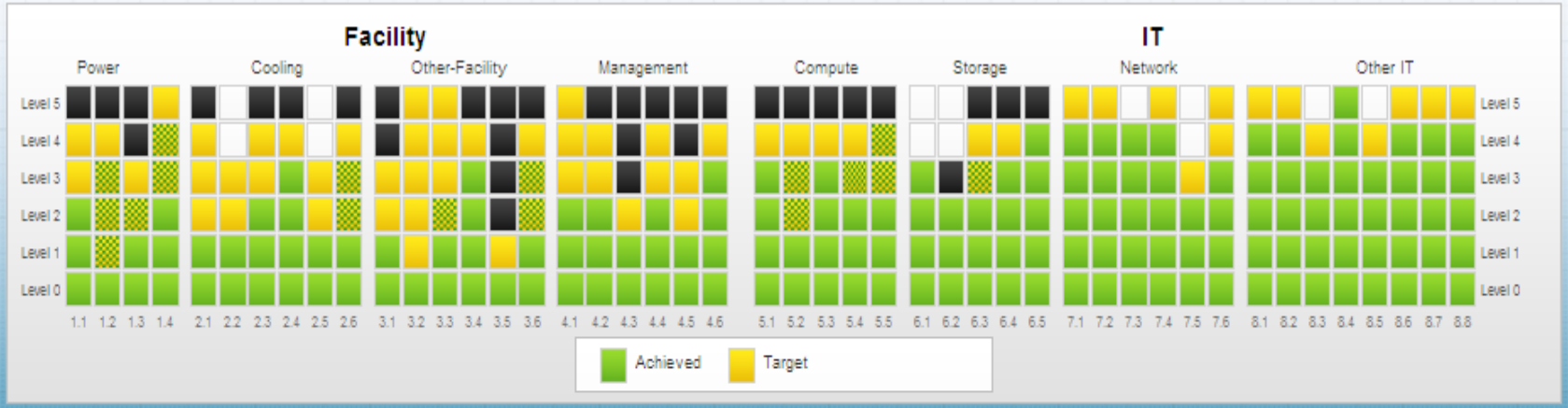


Facility

	Power			Assessment			Assessment
1.1	Critical Power Path Efficiency - Building Entrance to IT load			• 92% efficiency based on your typical utilization			• 94% efficiency based on your typical utilization
				• Consolidate transformers (use fewer series isolation transformers,			

Completed Assessment

Data Center Maturity Model - Completed Assessment (Carolina)



Copy Assessment

Please click on the 'Copy Assessment' button to create an updated revision to your assessment. Once selected a copy of your assessment (with a new ID and date) will be created which can be updated. The current

Export Assessment

View Benchmarks

Export Equalizer to PDF

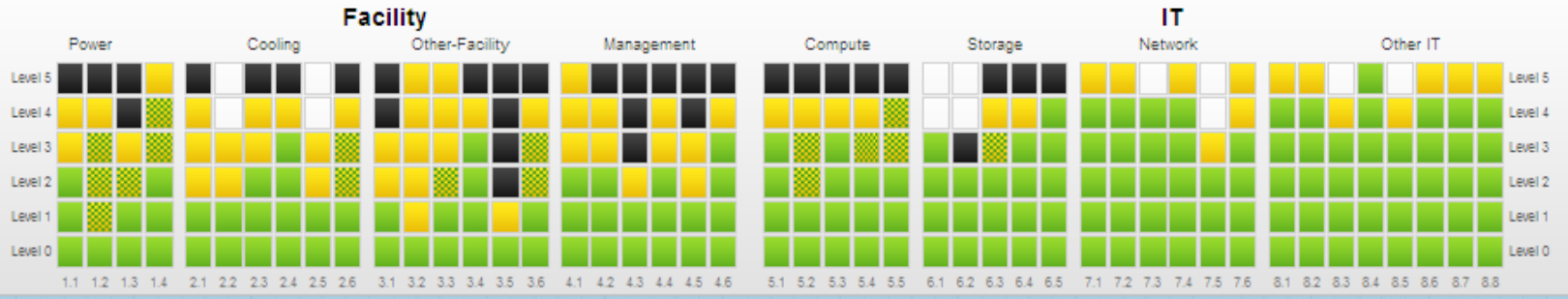
Export Assessment to Excel

Benchmark

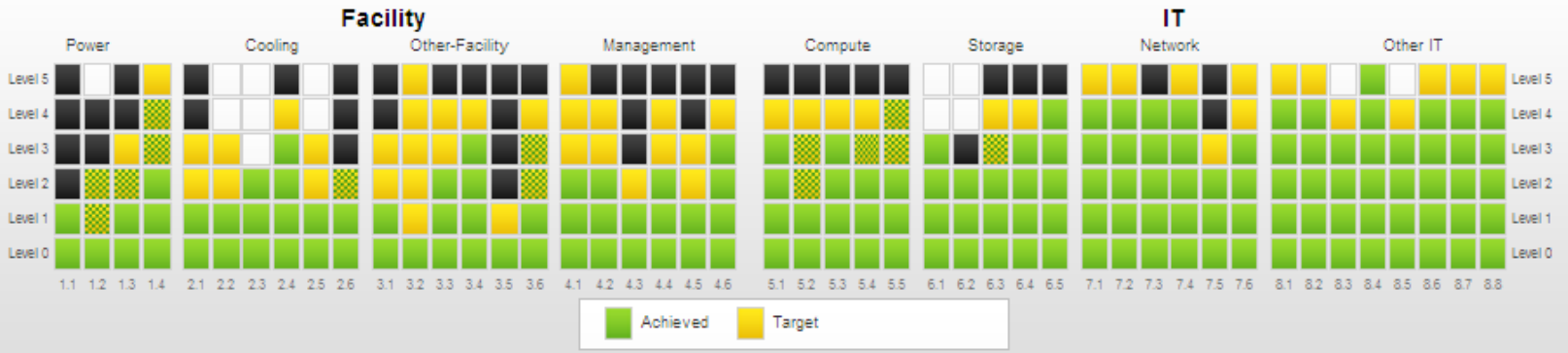
Facility | Power | Cooling | Other-Facility | Management | IT | Compute | Storage | Network | Other IT

Data Center Maturity Model - Benchmark (Carolina)

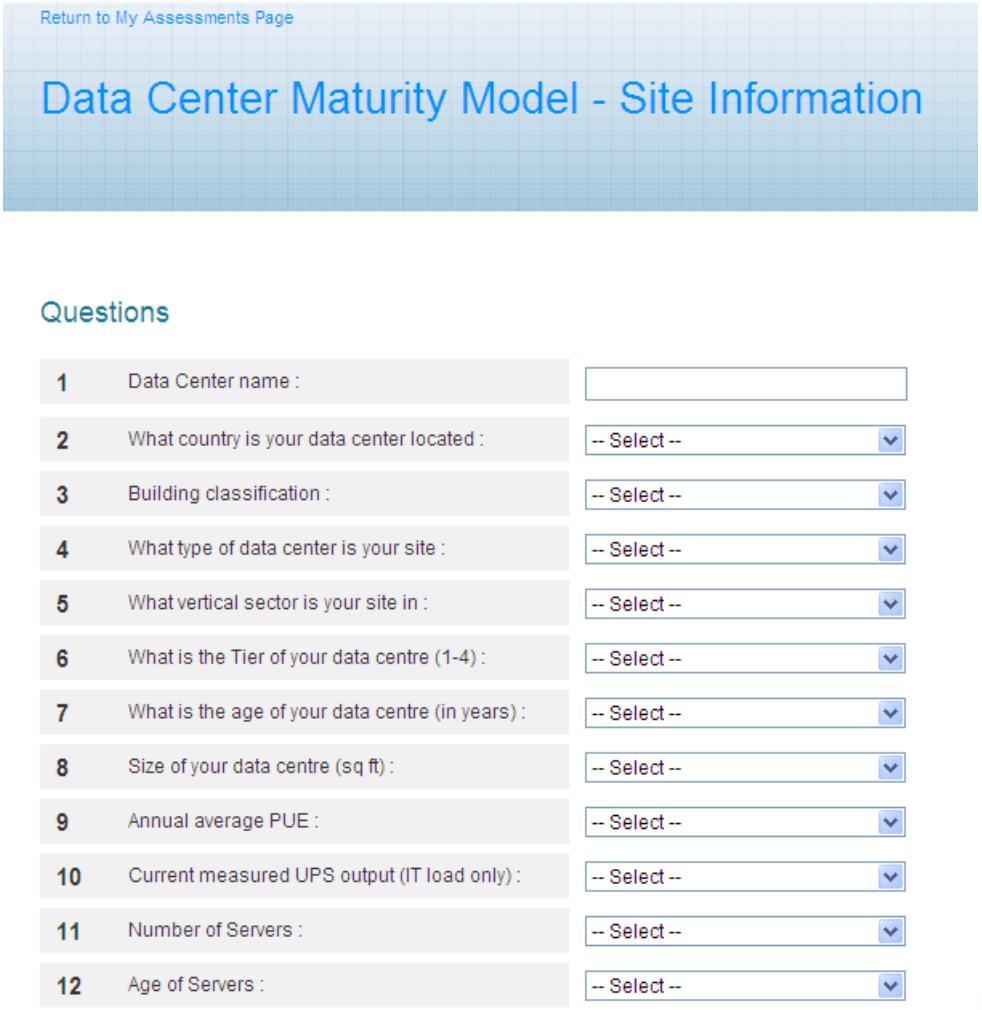
Your Assessment



Benchmark Data



Questions – why?



Return to My Assessments Page

Data Center Maturity Model - Site Information

Questions

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6	What is the Tier of your data centre (1-4) :	-- Select --
7	What is the age of your data centre (in years) :	-- Select --
8	Size of your data centre (sq ft) :	-- Select --
9	Annual average PUE :	-- Select --
10	Current measured UPS output (IT load only) :	-- Select --
11	Number of Servers :	-- Select --
12	Age of Servers :	-- Select --

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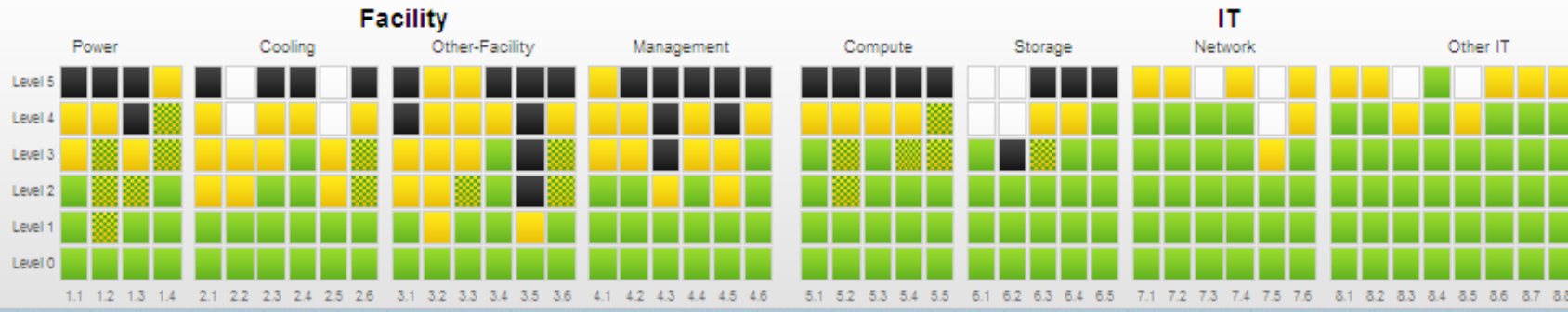
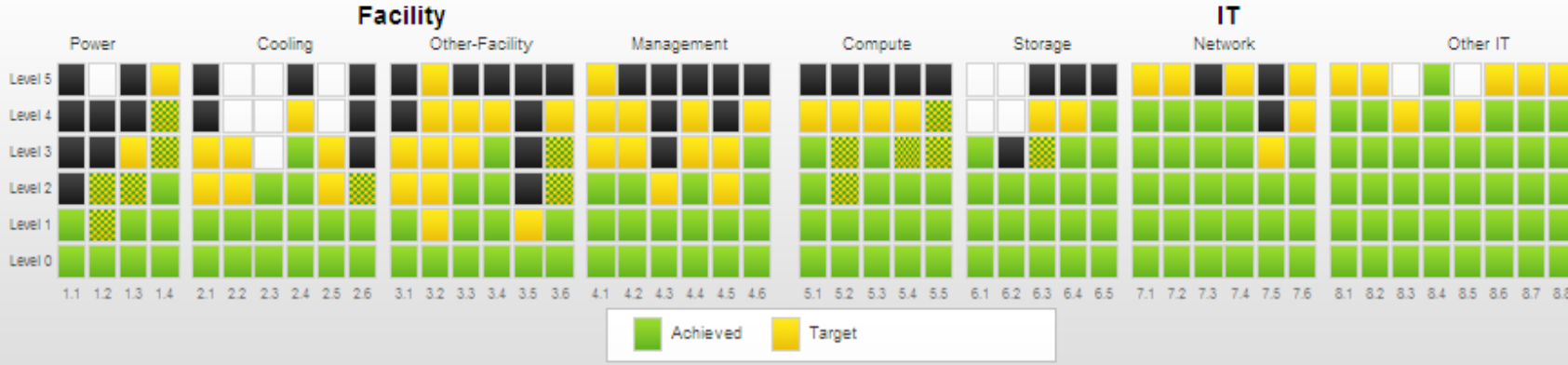
Your Assessment



Benchmark Data



Country:

- Uganda
- Ukraine
- United Arab Emirates
- United Kingdom

Type of Data Centre:

- Database Transactions
- Directory Services / Email
- Document Management
- Enterprise

Vertical Sector:

- Education
- Financial (inc. Banking)
- Government
- Healthcare

Tier:

- Tier 1
- Tier 2
- Tier 3
- Tier 4

Age of Data Centre:

- 2010 - present
- 2008 - 2010
- 2005 - 2008
- 2000 - 2005

Size of Data Centre:

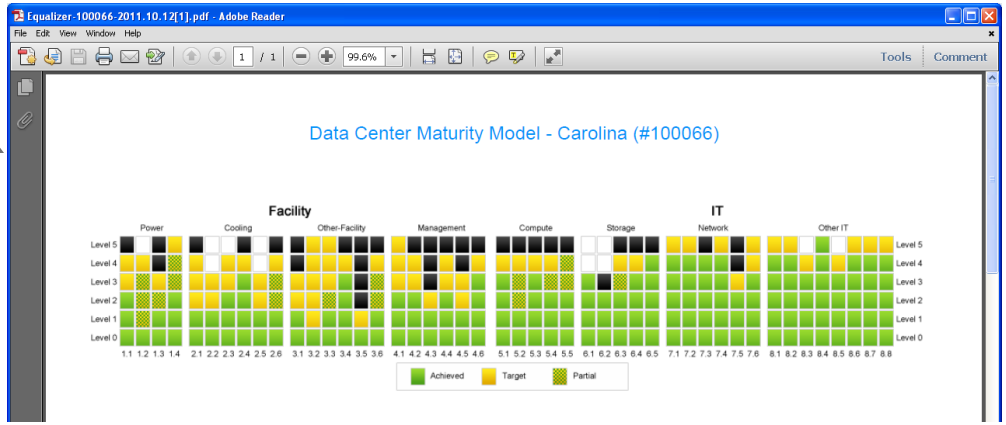
- Up to 2,500 sqft
- 2,500 sqft - 5,000 sqft
- 5,000 sqft - 10,000 sqft
- 10,000 sqft - 25,000 sqft

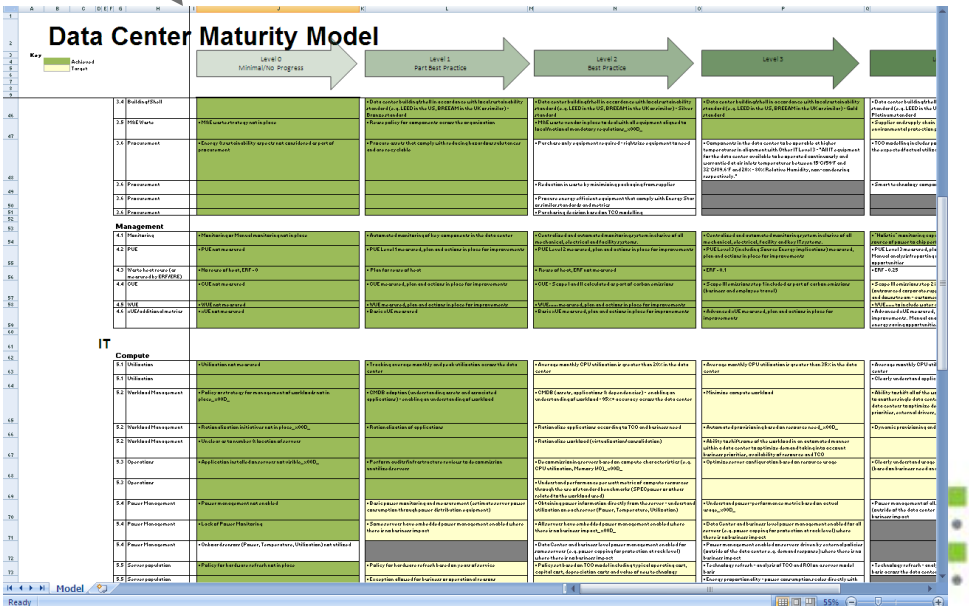
Appl

Assessment Tool - Export

Export Equalizer to PDF

Export Assessment to Excel





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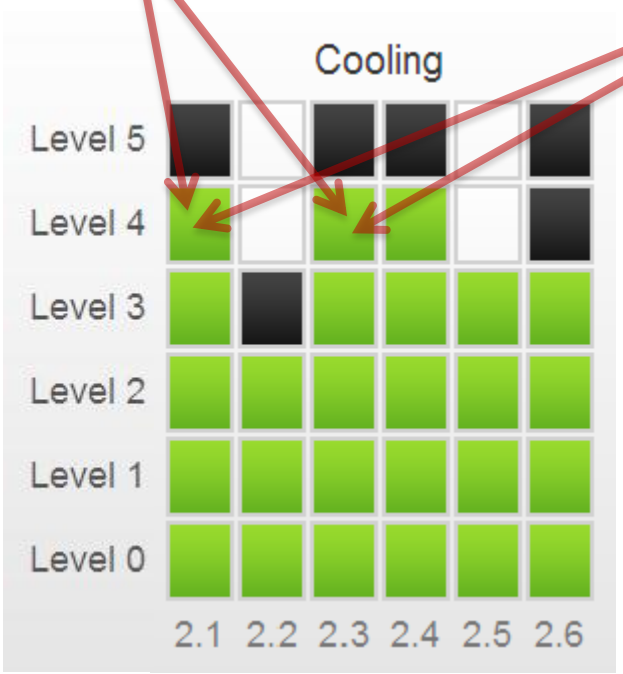
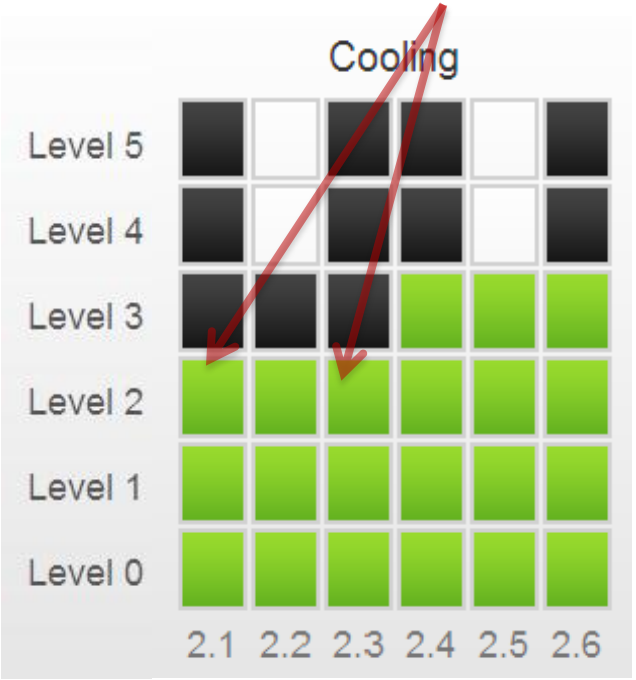
Vendor Benefit – product capability

Product A
Colder climate
e.g. UK, France, Iceland

Product C - 2013
Warmer climate
e.g. Singapore, HK

Product B
Warmer climate
e.g. Singapore, HK





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Summary

- Roadmap for the industry to significantly improve efficiency and sustainability

- Benchmark your data center using the Data Center Maturity Model Equalizer, thereby:
  - Seeing how you compare to best practice – Level 2
  - Identifying the ongoing steps and innovations required to achieve greater energy efficiency and sustainability improvements
  - Designing new data centers and IT using the model's higher levels

- Provides your C-level suite with a clear guide for improving the energy efficiency and sustainability of the data center portfolio

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