

Open-Source RAG Database

- EPRI open-sourced its entire corpus of public documents into a single vector database
- Open for use with any LLM
- Includes instructions for use



Open-Source Playbook: Hosting on-prem LLMs

- Playbook Overview
 - Primer on LLMs
 - Cloud vs. on-premises hosting considerations
 - Costs, security, infrastructure, etc.
 - How to set up and host a local model



Model	Vision	Occupational Tasks	Service Tasks	Embedded Knowledge	Non-Hallucination Rate
Frontier (Jun 2026)	✓	■■■■■	■■■■■	■■■■■	■■■■■
Frontier (Dec 2025)	✓	■■■■■	■■■■■	■■■■■	■■■■■
Qwen3.6 27B	✓	■■■■■	■■■■■	■■■■■	■■■■■
Qwen3.6 35B A3B	✓	■■■■■	■■■■■	■■■■■	■■■■■
Gemma 4 31B	✓	■■■■■	■■■■■	■■■■■	■■■■■
Gemma 4 26B A4B	✓	■■■■■	■■■■■	■■■■■	■■■■■
gpt-oss-120b	✗	■■■■■	■■■■■	■■■■■	■■■■■

Five New White Papers from OPAI

- Adopting, Deploying, and Scaling AI at an Organization
- Cyber Security Impacts of AI (Mythos/Fable and Glasswing)
- Merging Human and AI Input
- Managing an AI Center of Excellence
- Tokenomics

Implementation and Deployment WG Updates

- Upcoming deliverables:
 - Utility Data Management Strategy Framework – Q4 2026
 - Utility Business Intelligence Playbook – Q4 2026
 - Adopting, Deploying, and Scaling AI – Q4 2026
 - Securing Self-Hosted LLMs and Sandboxes – Q1 2027 (website)
- Upcoming WG Meetings
 - October 14 – Microsoft and Pampa
 - November 11 – EPRI HASE Project & Walz Oral History
 - December 9 – TBD



Powered by EPRI

OPEN POWER AI CONSORTIUM



300+
Global
Members

Learn More:
www.openpowerai.org



Our Work Groups

Domain-specific model



Domain-specific
model trained on
energy-specific
datasets

Use Case Sandbox



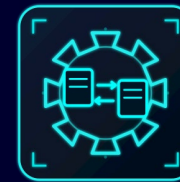
Identify, prioritize,
and evaluate
real-world
applications

Implementation



Share methods &
best practices for
AI deployment
and scaling

Data Sharing



Develop template
data sharing
agreements to
obtain data

Domain-Specific Model
Includes Knowledge from

>10,000
EPRI reports



250+

use cases identified for
consortium prioritization
and development

Join us in Shaping the Future of AI and Energy

Open Power AI Consortium – Key Objectives

**Develop AI Models,
Data & Roadmaps**



**Create an AI
Sandbox**



**Implementation and
Lessons Learned**



Create an ecosystem for stakeholders to identify, develop, validate and deploy AI solutions to transform the electric sector

OPAI Participants

AI and Energy Technology Partners



Academia & Other Strategic Partners



Energy Partners



OPAI Consortium Member Engagement





Year 1: Outcomes, Opportunities, & Challenges

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Gemma 4 26B A4B	✓	■■■■■	■■■■■	■■■■■	■■■■■
gpt-oss-120b	✗	■■■■■	■■■■■	■■■■■	■■■■■

The Power Sector's AI Benchmarking Hub

How Today's Leading LLMs Perform on Power-Sector Questions

EPRI benchmarks leading large language models on **real-world, utility-relevant questions** to help the power sector understand where today's AI systems are strong, **where they fall short**, and how performance evolves over time.

● Live Benchmark — Updated as new models are evaluated

[Download White Paper →](#)[Watch Benchmarking Discussion →](#)

Multiple-choice evaluations



Open-ended short answers



Multi-run repeatability



Domain-augmented tools

INTERACTIVE BENCHMARK

Explore how selected models perform across EPRI benchmark datasets, including **short-answer** and **multiple-choice questions**, **model-only** and **web-search modes**, and breakdowns by **difficulty** or **topic**.

DATASET ⓘ

☒ Multiple-Choice Questions (MCQ)

☐ Short-Answer Questions (SAQ)

MODE ⓘ

☒ Search Off (Model Only)

☐ Search On (Web Search)

VIEW ⓘ

☒ Overall

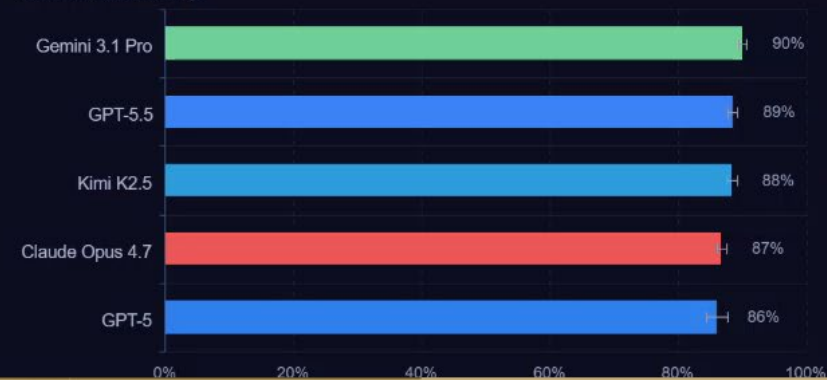
☐ By Difficulty

☐ By Topic

MCQ — Overall

Weighted Accuracy (%)

Search Off (Model Only)



WattWorks:
Benchmarking
LLMs for Power
Industry
Applications

Data Readiness White Paper

How can we properly leverage data to support AI initiatives?



EPRI



2025 White Paper

AI Readiness in Utilities: Turning Data into Strategic Advantage



The first in a series of guidance documents to accelerate AI implementation

Quantum Computing & Energy White Paper

How will quantum computing
affect the future energy needs
of AI?



EPRI



Quantum Computing and AI Infrastructure:
An Analysis of Complementary Technologies

Technical Assessment for Power Infrastructure Planning

**The second in a series of guidance documents
to accelerate AI implementation**



Year 1: Outcomes, Opportunities, & Challenges



=

AI for Power Challenge

- AI challenge to accelerate deployment of AI solutions for prioritized use cases.
- Leverages IEL's rapid-demonstration process to source and evaluate AI solutions

What's Next

Project
Developed
& Released

Priority Used
Cases from
OPAI

Launch:
Call for
Applications

Initial Project
Review
(150->50)

Detailed
Review
(50->20)

Pitch Day
Summer
Seminar
August

Pitch Day
Summer
Seminar
August

SAFERai.power | Trusted AI for the Electric Sector

One sector-wide framework to assess risk, calibrate autonomy, and evidence trusted AI — rigorous where consequences are high, lightweight where risk is low.

WHY NOW

- AI is moving from pilots into live grid, asset, and customer operations.
- Failures carry safety, reliability, and regulatory consequences, not just cost.
- Without a shared framework, every utility and regulator builds its own, duplicating effort and risk.

THE SAFER FRAMEWORK

- S Safety:** protects people, assets, & the grid
- A Accountability:** clear human ownership of AI actions
- F Fairness:** unbiased data and outcomes
- E Explainability:** decisions you can audit
- R Reliability:** performs under real grid conditions

OVERSIGHT & EVIDENCE SCALE WITH AUTONOMY AND CONSEQUENCE

ADVISORY



SUPERVISED
ACTION



GUARDED
AUTONOMY



AUTONOMOUS

EVIDENCE • ASSURANCE • TRUST • VALUE



Leadership Council Input



What other products does your organization need?



What organizations are missing from the consortium (OpenAI, Anthropic, etc.)?



Will the open-source RAG Database be useful for your organization?

- What other organizations should release similar information?



Meeting frequency?



TOGETHER...SHAPING THE FUTURE OF ENERGY®



OPEN POWER AI CONSORTIUM

AI for Power Challenge



300+ consortium members

100+ technology partners

50+ prioritized AI use cases from >250

8 years running

~100 demo projects completed

1,000+ startups evaluated

=



Deployment Partners



What's Next



OPAI Priority
Use Cases
Developed



Challenge Site
Design and
Build



Call for
Applications



Solutions
Down
Select



Pitch Day
Summer
Seminar
August 5

Demo
scoping and
contracting
Q3 2026

Demo
Execution
Q4 2026 –
Q1 2027

2026

PITCH DAY

AI for Power Challenge

AUG.
4-6

Powered by
EPRI

- The AI for Power Challenge provides a streamlined path from solution discovery to deployment
- Finalists selected by participating utilities based on interest on their demo proposals

Grid T&D Operations, Planning, and Markets



Biospheric AI



GRID SIGHT

NOVVE

routora



Sidecar
Infrastructure

SUNAIRIO

Grid Asset Management and Performance

ARKION



BUCKSTOP

OrbuFu
Earthflow
UNDERGROUND



Magnefy

Senpilot



RasterReport

Y A



Y A

CAPITAL PLANNING INTELLIGENCE FOR INFRASTRUCTURE

Power Plants (Nuclear, Thermal)



cohere

fibrX



EVERSTAR

metroscope

Grid ICT and Data Management



WhyGrene™

Axiom Powers



sensewaves

Regulation, Compliance, and Workforce



SURESTEPS



TerrAssist

Pitch Day → Demo Scoping

- Scoping 14 demo opportunities with 9 utilities and deployment partners
- EPRI support for scoping, contracting, implementation, and knowledge sharing



It is not too late to join!

Choose your program access. Then fund a demo if you want to help shape it.

1 CHOOSE YOUR PROGRAM ACCESS

Membership determines what you receive across all demos

OBSERVER

Executive summaries of all demos

Program access and monthly meetings

\$35K / year

OR

PARTICIPANT

Full reports for all demos

Project meetings and demo folders across the program

\$65K / year

+

RUN OR CO-FUND

Any member that funds a demo can help shape it

Define or influence scope • Engage utility experts • Attend funded-demo meetings

2 OPTIONALLY FUND A DEMO

Funding determines your involvement in that demo

Thank you!

Sandra Chavez: schavez@epri.com

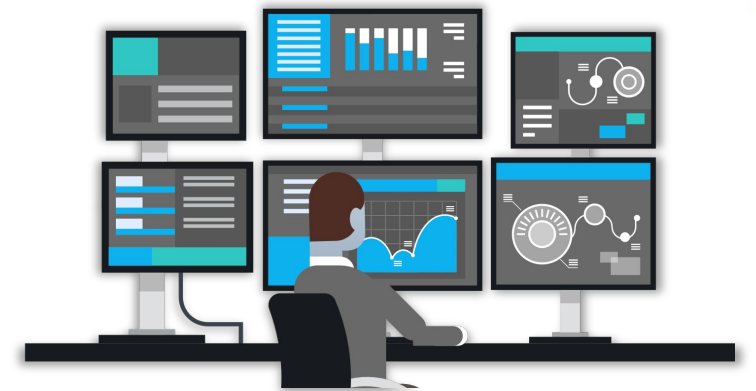
Sarah Toews: SToews@epri.com

OPAI AI – The Global AI in Energy Initiative

Use Case Work Stream – Survey Results
September 2026



Adrian Kelly OPAI Use Cases Workstream Lead
akelly@epri.com



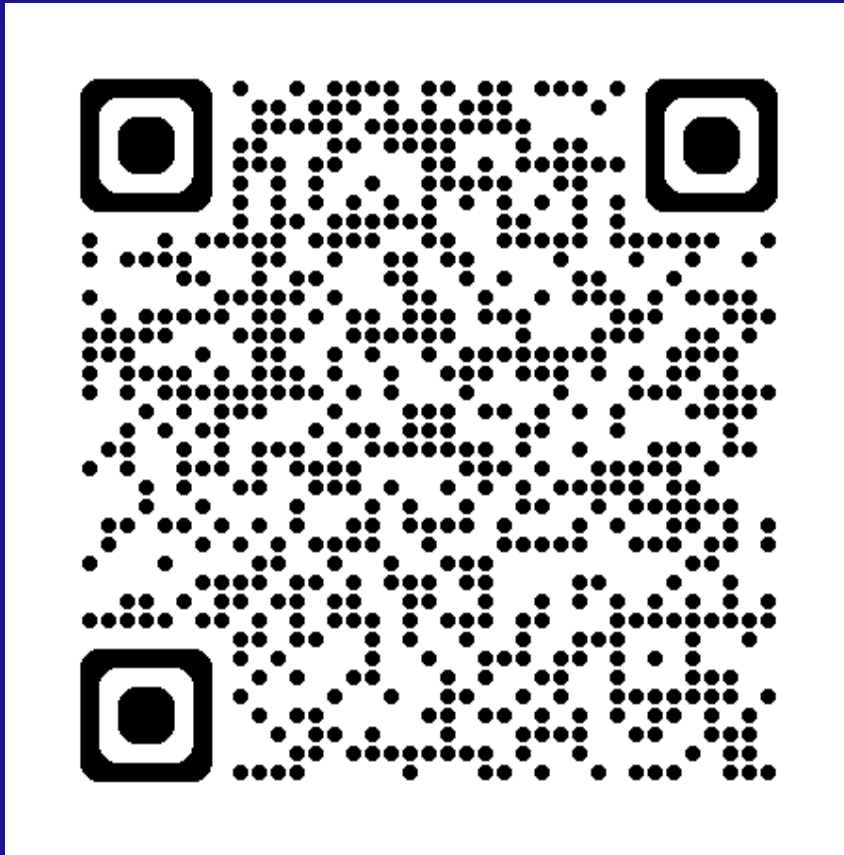
OPAI Use Case Survey Links – Remains Open Indefinitely



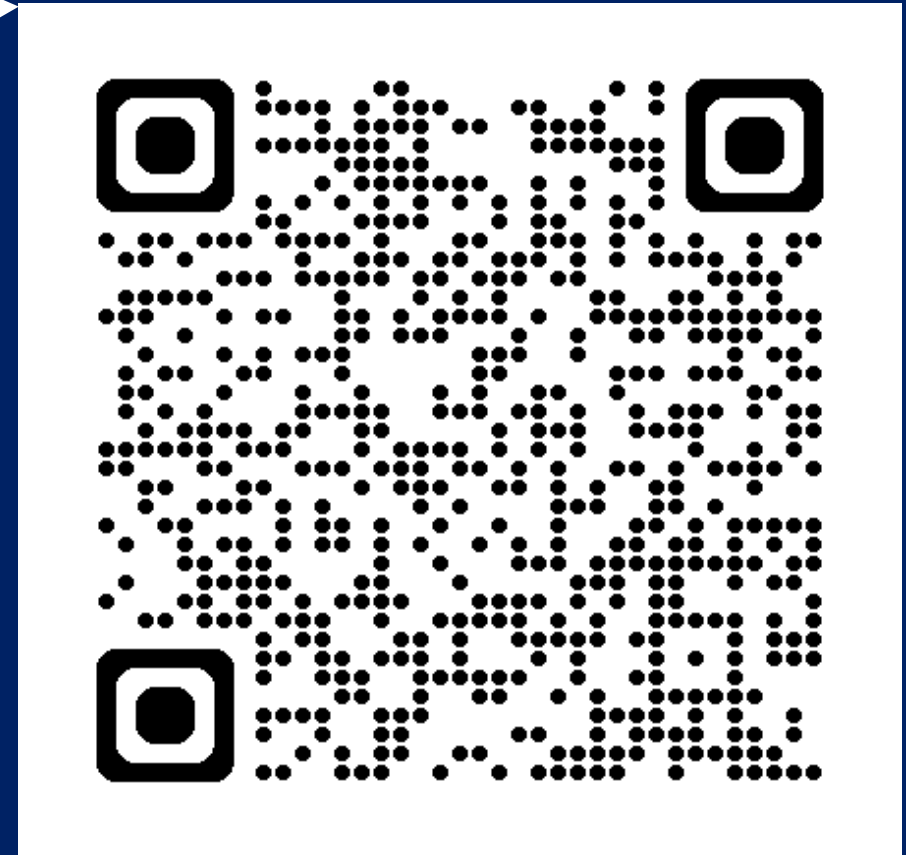
Energy Utility Survey



Technology Provider Survey



Click or Scan



<https://www.surveymonkey.com/r/OPAI-Use-Cases-Utilities>

<https://www.surveymonkey.com/r/OPAI-USE-Cases-Tech-Providers>

Use Case Survey By the Numbers – So Far!



77

*113 Entities Submitted at
Least 1 Response*



36

Utilities

13806

*14925 Data Entries (Evaluation,
Maturity or Comment)*

1119

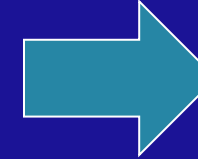
Technology Providers

*Assuming ~20 Seconds Entry – Cumulative Total of ~83 hours of data entry
Thank You!*

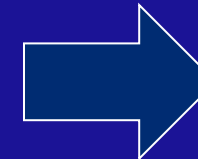
Transforming Survey Data to OPAI Member Value

Use Case
Assessment
Criteria
Prioritization

- Top 5-10 Reliability and Resilience
- Easiest to implement
- Least risky...etc
- Company confidential benchmarks relative to industry



Published soon on
<https://openpowerai.org/>



Use Case Co-Development

Utility and
Industry Demo
Spotlights

- Reference and spotlight utility or technology use case implementations

Use Case
Functional
Prioritisation

- Top 5 10 Asset Management
- Top 5-10 Operations
- Top 5-10 Markets, Nuclear....etc

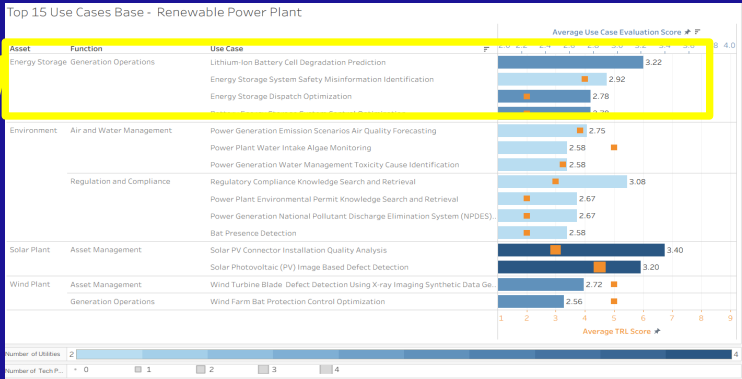
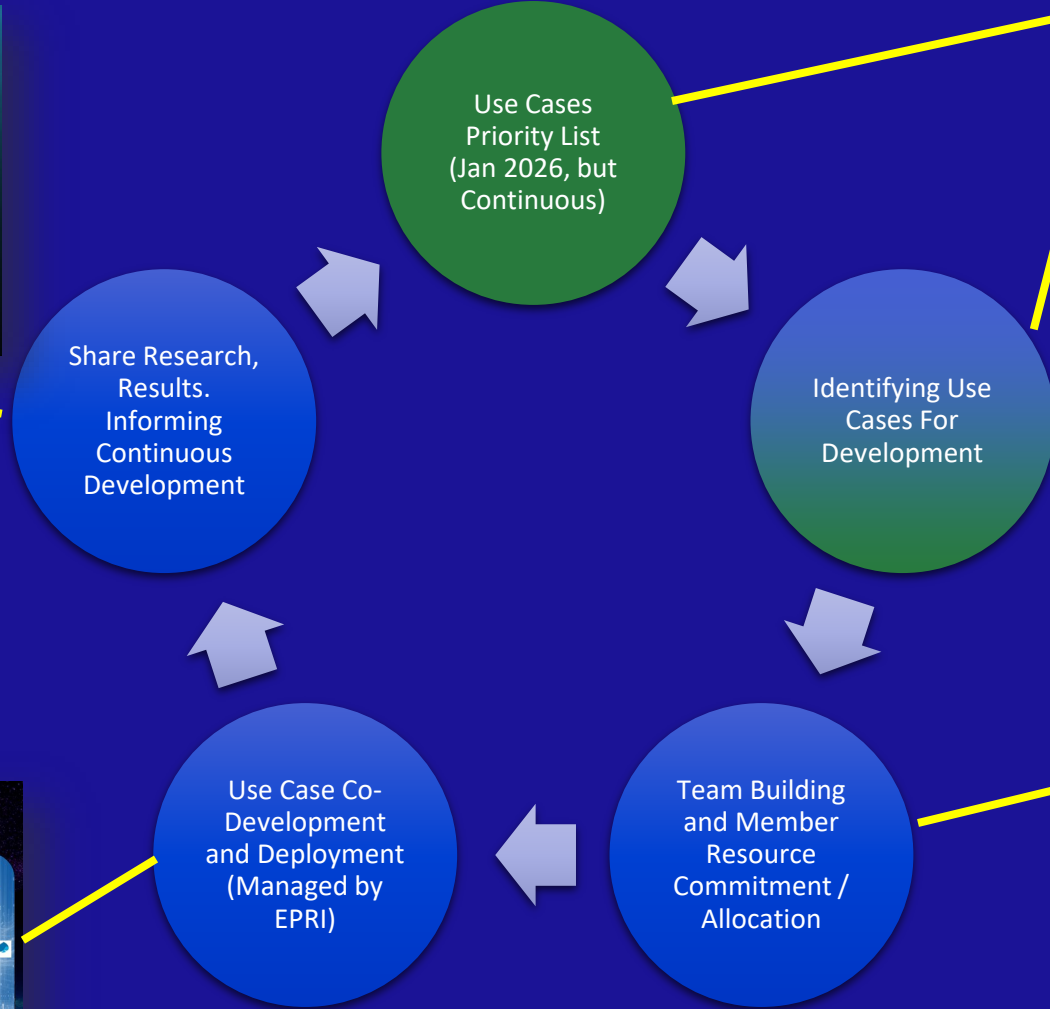
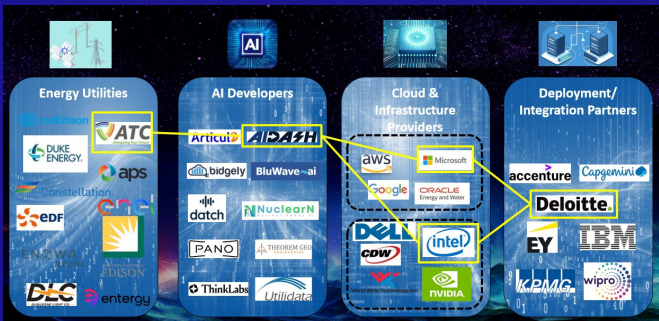
Use Case to
Technology
Matching

- Map high priority use cases to medium to high technology solution maturity

Use Case Co-
Development

- OPAI will bring forward the highest priority use cases for co-development
- Potential data availability identified in survey, utilities with highest need may provide

Proposed Use Case Solution Development Process



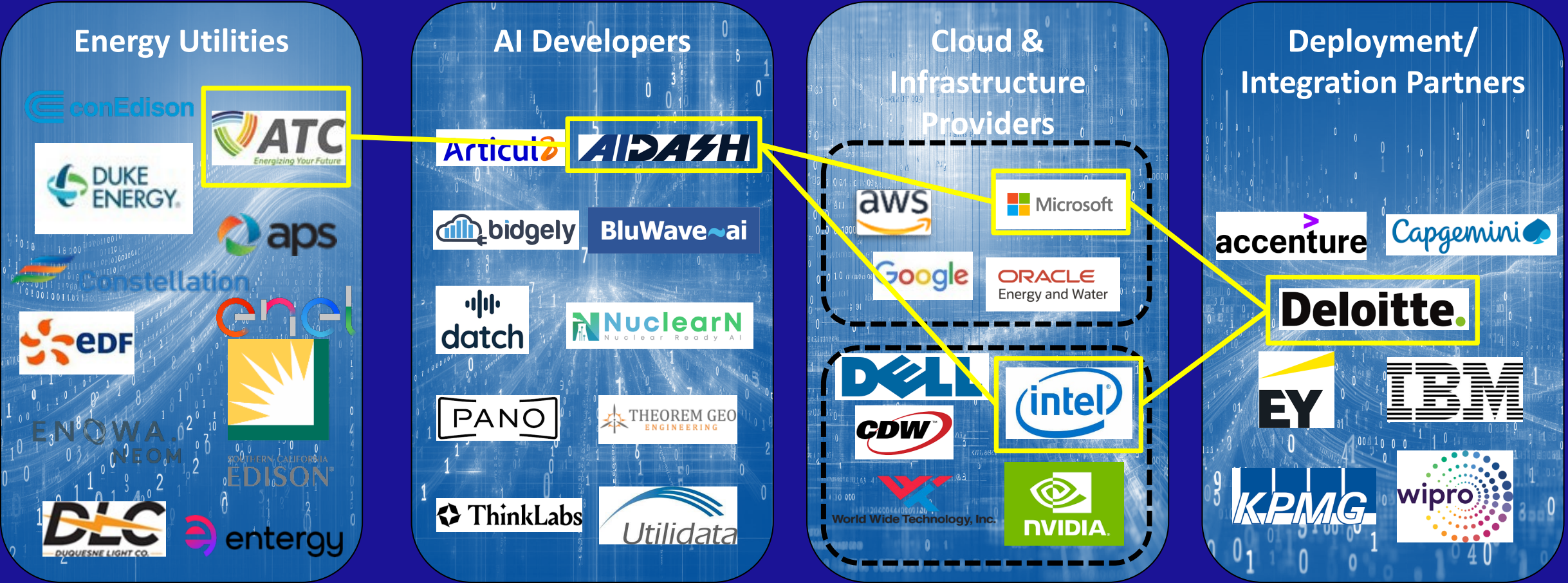
4. Grid and Asset High-Speed Recording Data Insights

High-frequency data from Digital Fault Recorders (DFRs) and transient recorders is analyzed using deep learning to detect sub-cycle events and transient disturbances as well as power quality. AI models can automatically classify fault types, identify affected components, and reconstruct event timelines. Pattern recognition and clustering models identify recurring issues and affected network areas. Insights support root cause analysis and corrective actions. This helps utilities maintain compliance with power quality standards and improve customer satisfaction. These insights support root cause analysis and post-event reporting. Integration with asset condition monitoring enhances predictive maintenance strategies.

	Energy Utility	Technology Provider
Use Case Scoping Support (e.g. Persona Development)	☐	☐
Engineering Oversight and Guidance	☐	☐
Engineering Development Resources (software development, data collation)	☐	☐
Data Visualization User Interaction Design and Guidance	☐	☐
Data - Structured - Models or Streaming Data (Could be Real or Capable of Being Synthesized)	☐	☐
Data - Unstructured - Images, Documents, Videos, Sound	☐	☐
Hardware or Physical		

Co-Developing and Deploying AI Solutions with Partners

Priority Use Case #1: Interested OPAI Members commit to developing, piloting, and (potentially) deploying solutions (hypothetical example for Use Case #1)



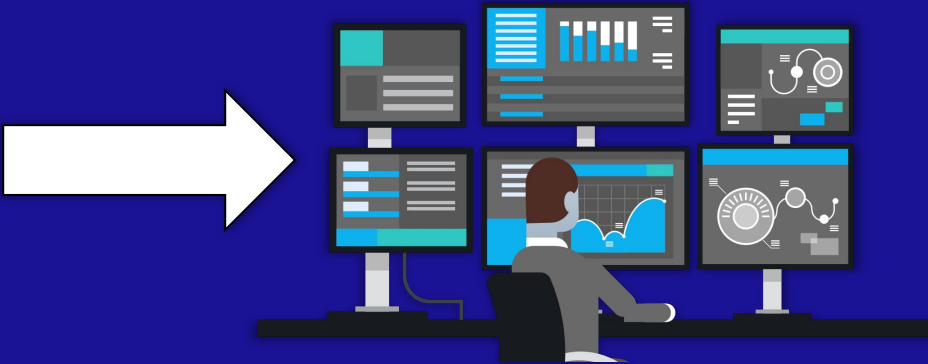
What Does This Look Like for a Typical Use Case?

Use Case Priority Domestic Outage Detection and Analytics using Advanced Metering Infrastructure (AMI)

AI detects and analyzes customer-level outages using real-time AMI ping data, consumption drops, and voltage anomalies.

The system automatically clusters affected meters and identifies likely fault zones. Insights support faster fault localization and crew dispatch.

Historical data is used to identify patterns in domestic outage behavior.



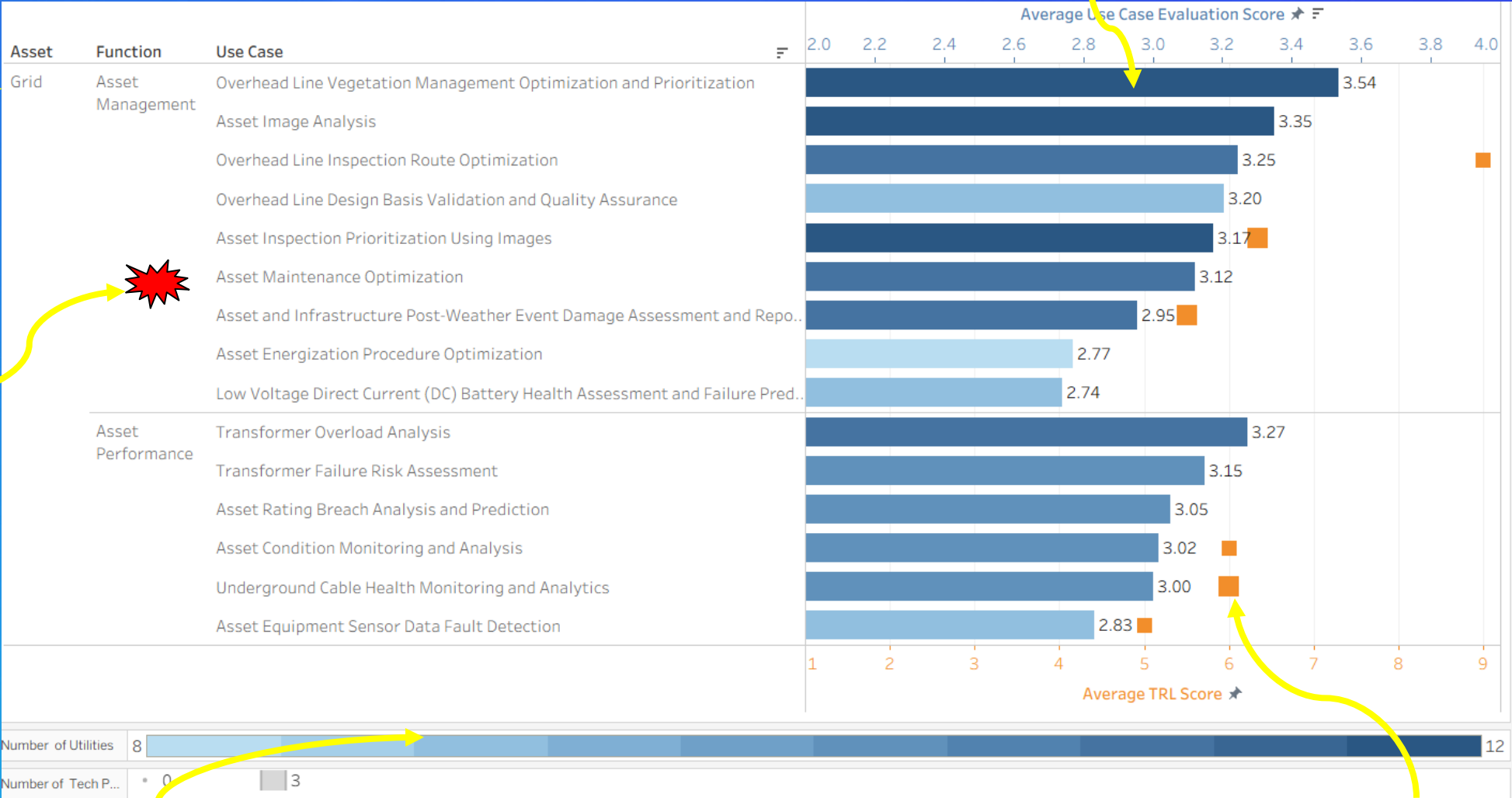
Development Phase	 Energy Utility Contributions	 Technology Provider Contribution
Requirements Discovery & Prototyping	Define the problem, scope, personas, define data, define end state.	Defining architecture, app requirements, building blocks available.
Environment Setup & Data Engineering	Data provision, synthesization, quality checking	Compute resource design and allocation
Core Development & Model Integration	Oversight on product direction, features	App and AI model development, CI/CD pipelines
QA, Security, and UAT	User testing and feedback, integration oversight and design (IT/OT teams)	Test harness development, cyber security, AI model validation
Deployment & Operational Monitoring	Demo of application, sandboxing, feedback on prototype	Deploy and troubleshoot prototype application

How to Read the OPAI Use Case Survey Results Charts

Score is out of 5. 3+ is a good score.
Shown on the blue axis. Sorted by highest score to lowest.
Top 15 usually shown

Asset, Function and Name of Use Cases

A use case that an OPAI member has expressed interest in co-developing

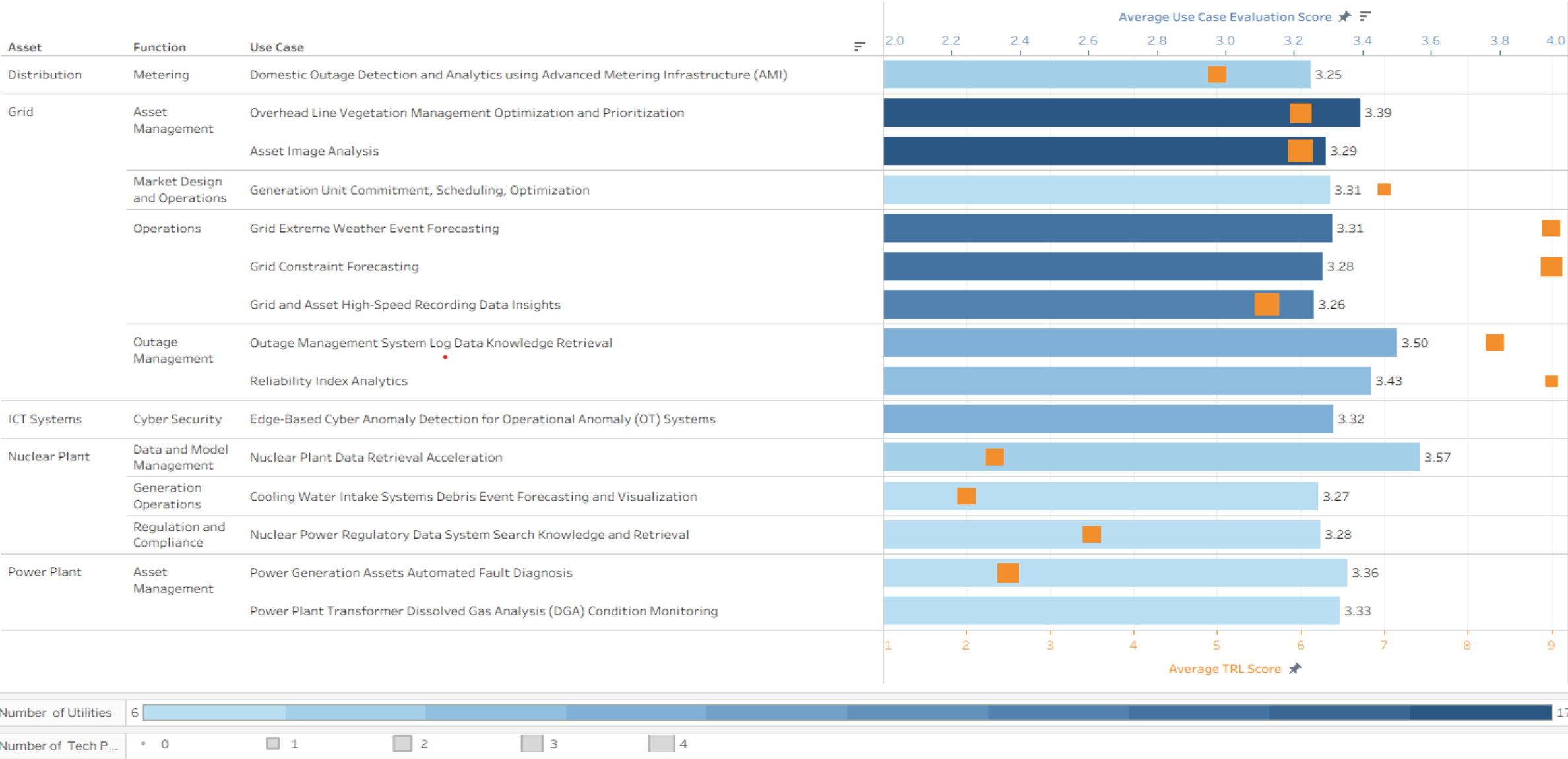


Color of the bars indicate the number of utilities who evaluated the survey. Darker is more utilities. Legend at bottom, usually 5+

Orange square is average TRL score 1-9. The size of the square indicates number of Tech provider respondents

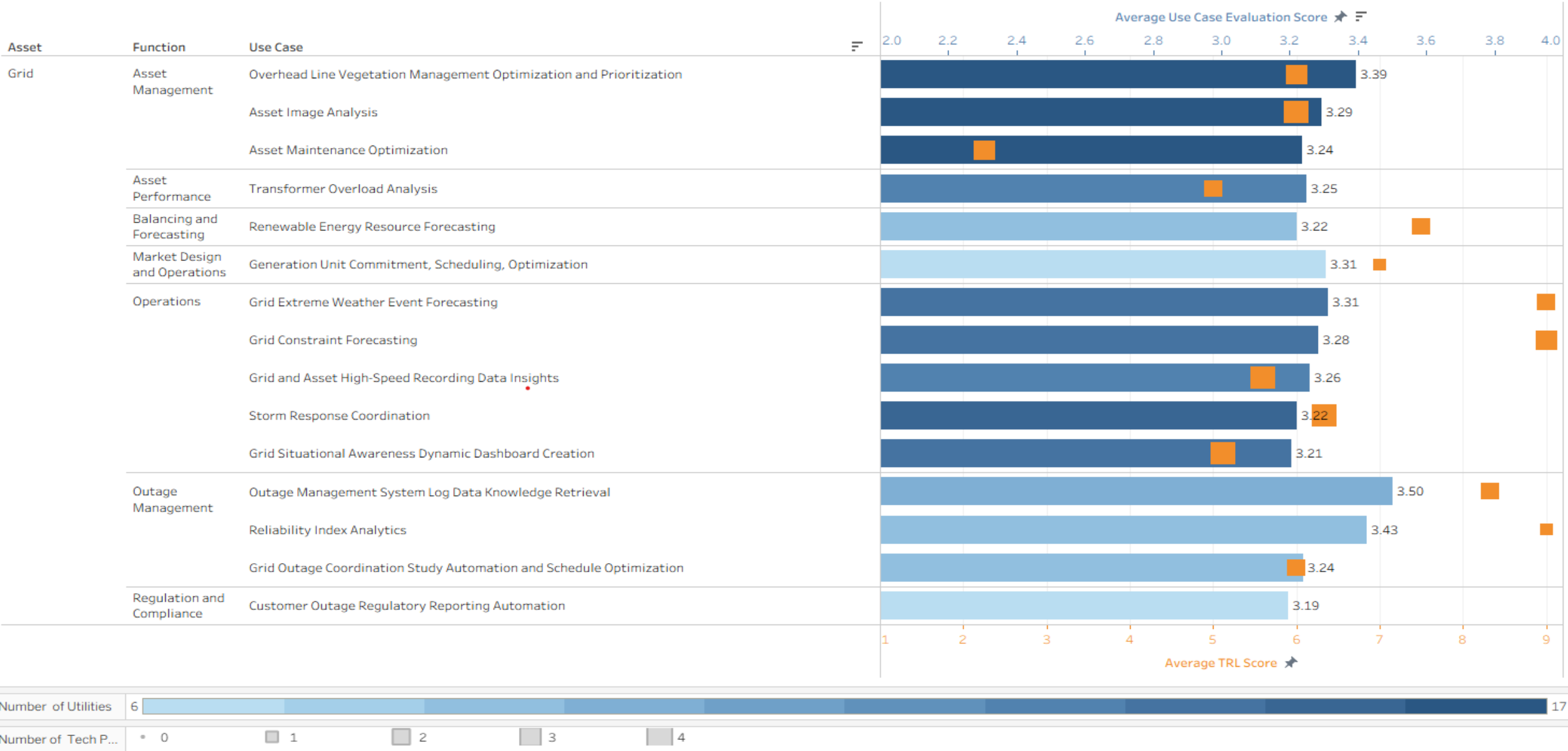
Top 15 of All Use Cases

Top 15 Use Cases Base - All Assets and Functions

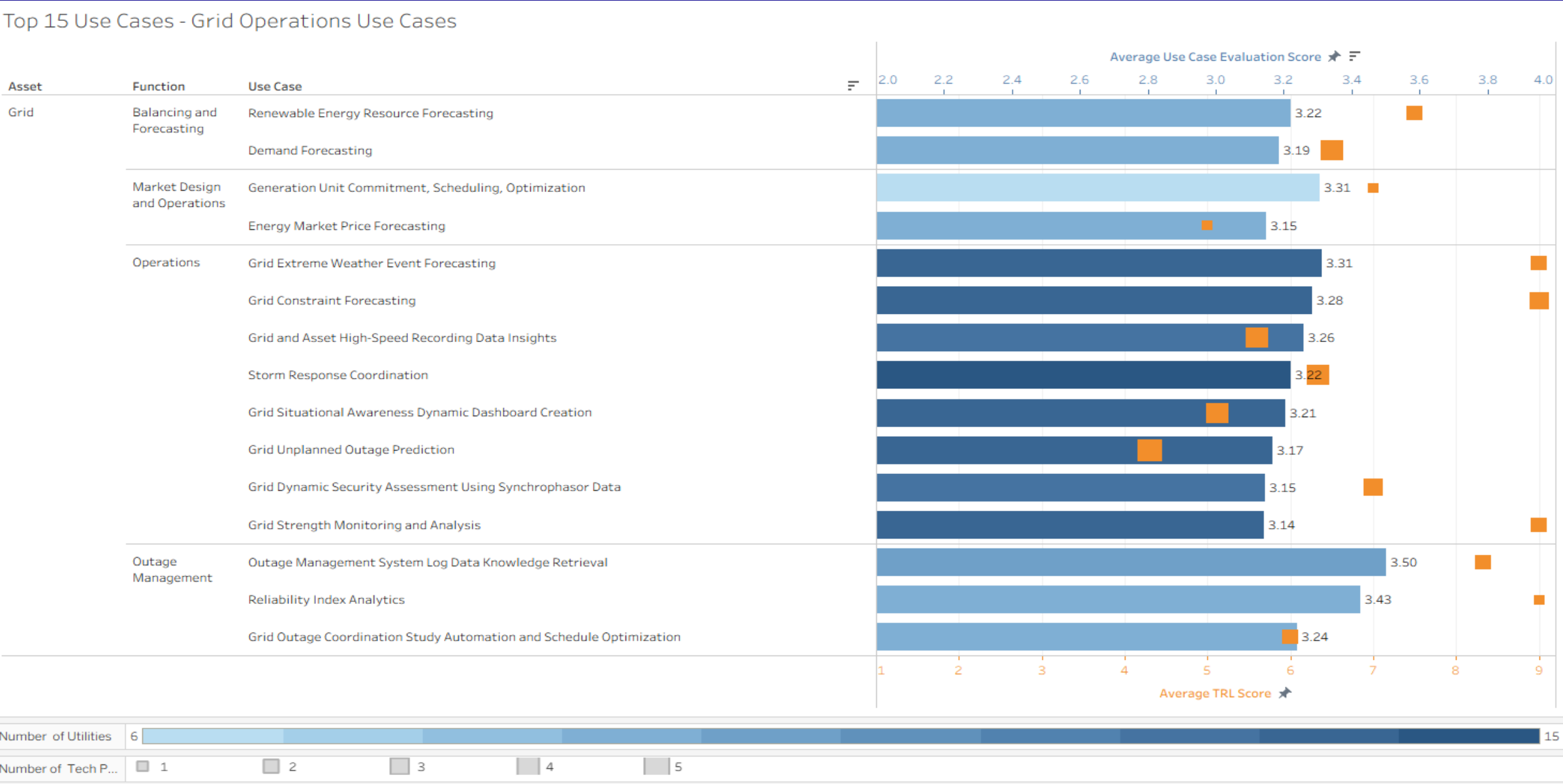


Top 15 Grid Use Cases

Top 15 Use Cases Base - Grid Use Cases

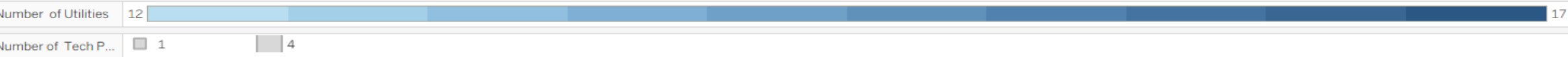
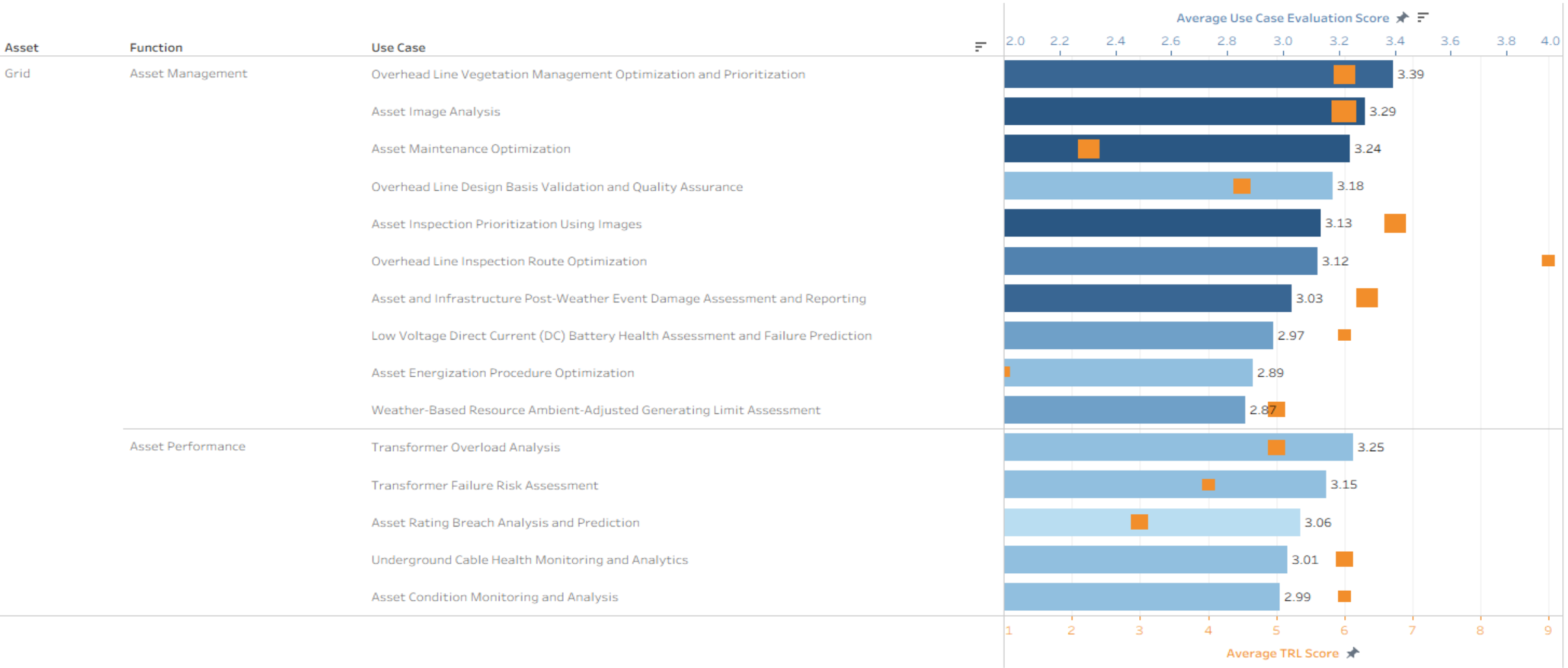


Top 15 - Grid Operations Use Cases



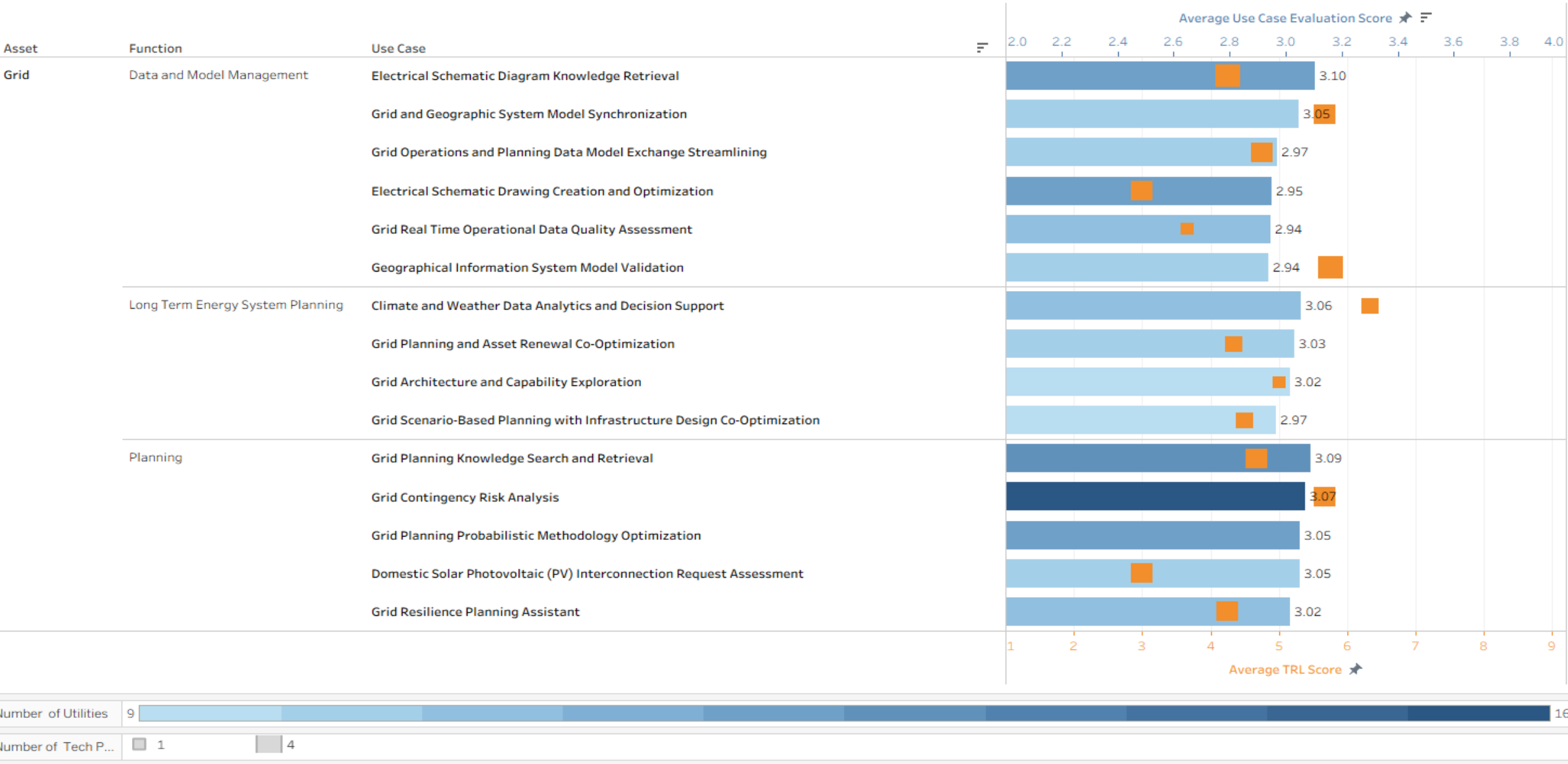
Top 15 - Grid Asset Management Use Cases

Top Use Cases - Grid Asset Management



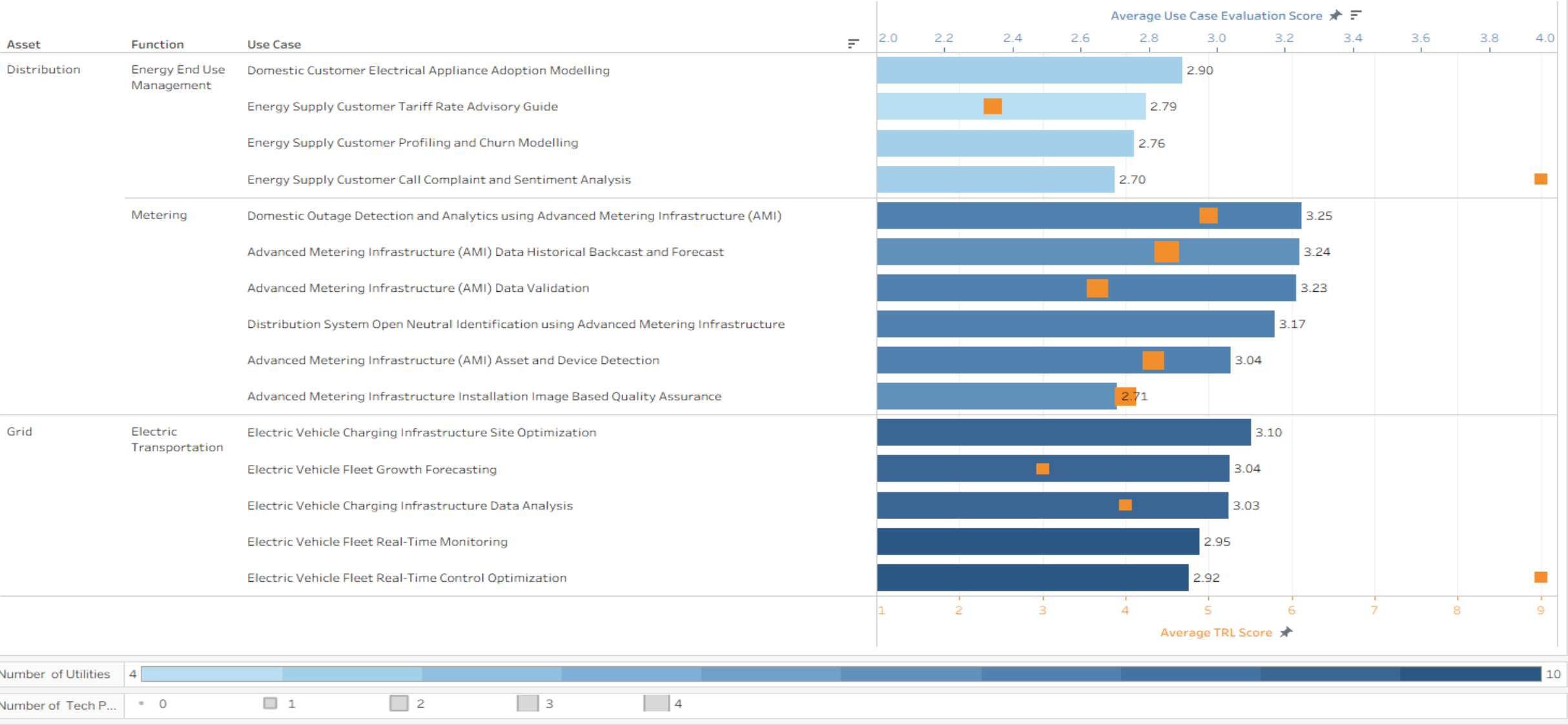
Top 15 - Grid Planning and Modelling Use Cases

Top Use Cases - Grid Planning and Modelling



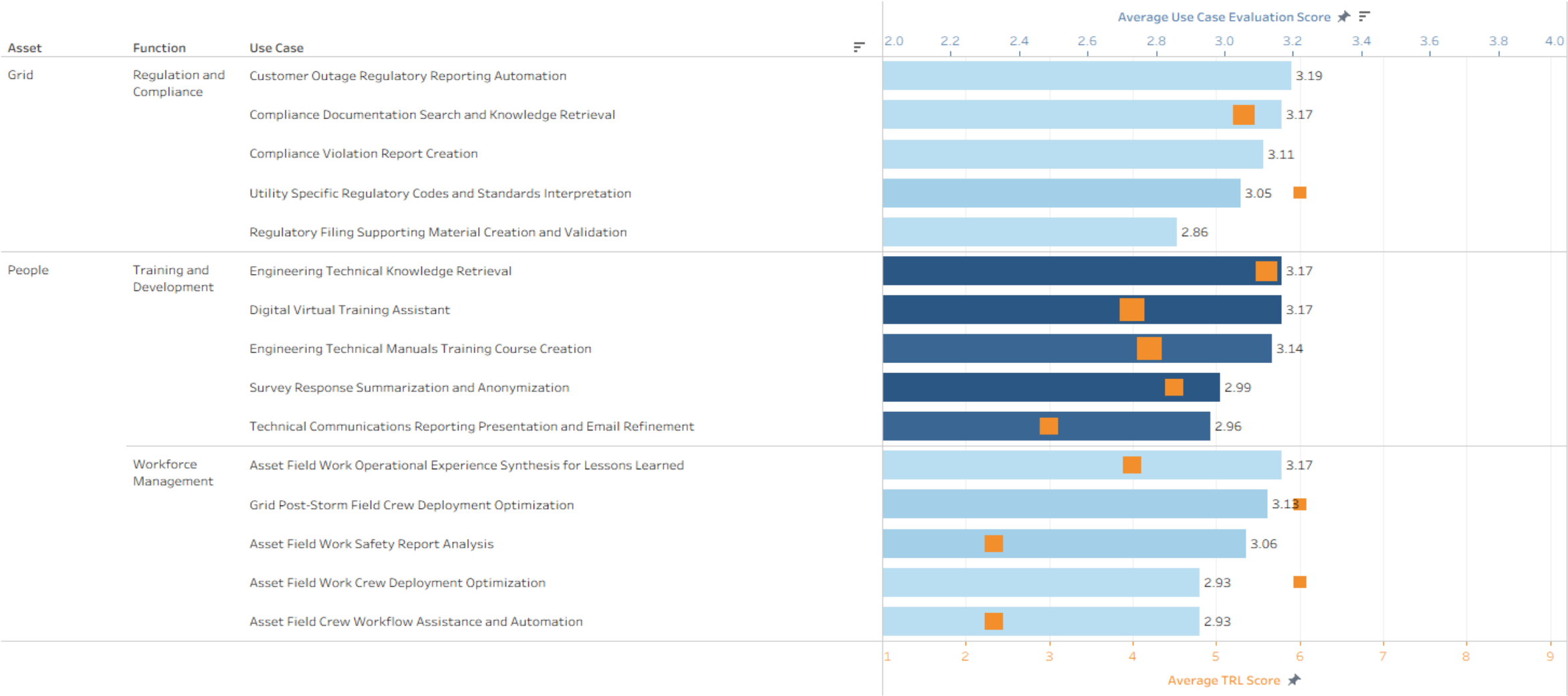
Top 15 Use Cases – Distribution & Energy End Use Cases

Top 15 Use Cases - Distribution and Energy End Use



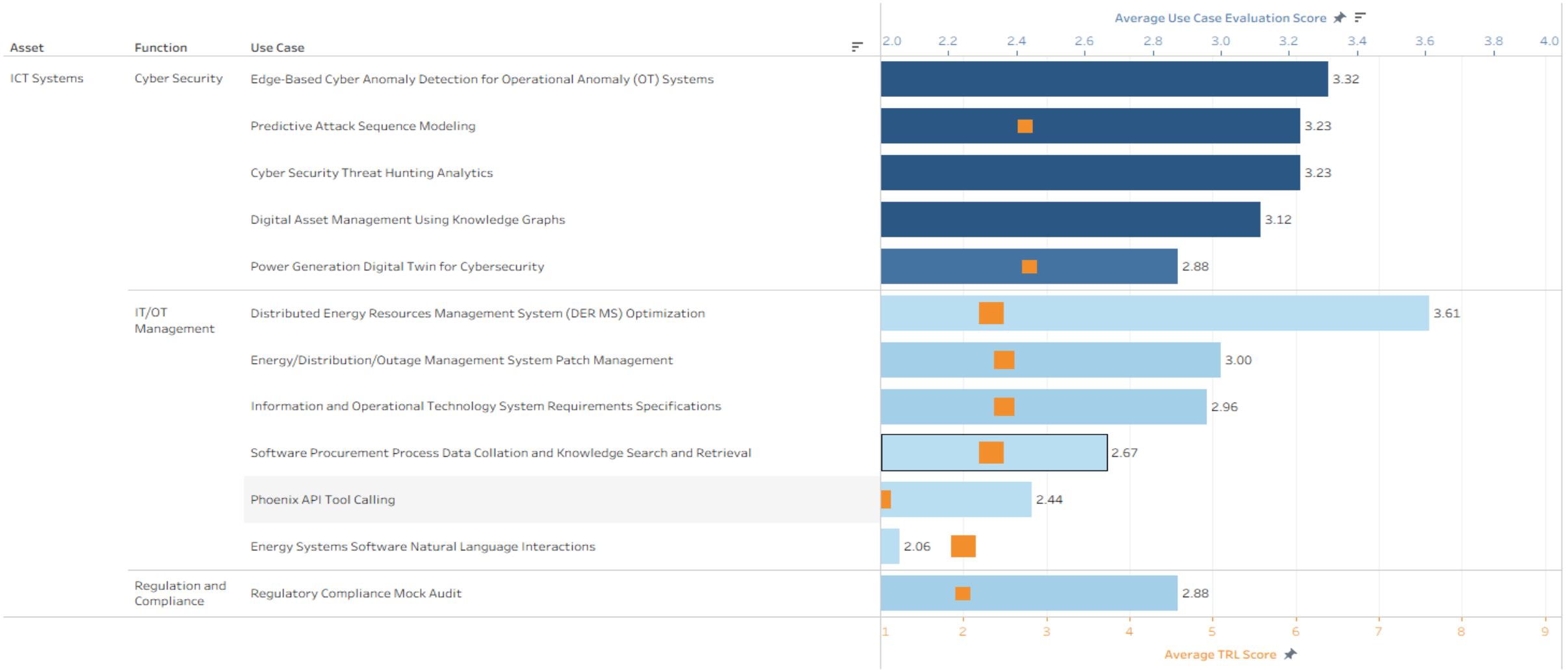
Top 15 - Regulation and Compliance and Workforce Management

Top 15 Use Cases - Grid Regulation and People



Top 15 Use Cases – ICT

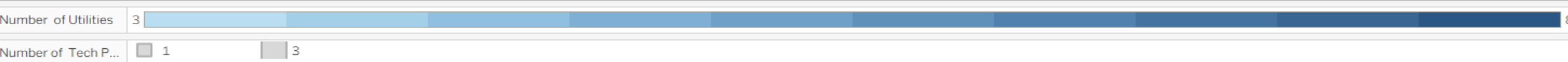
Top 15 Use Cases - Information and Communication Technology



Number of Utilities	3		10
Number of Tech P...	0	3	

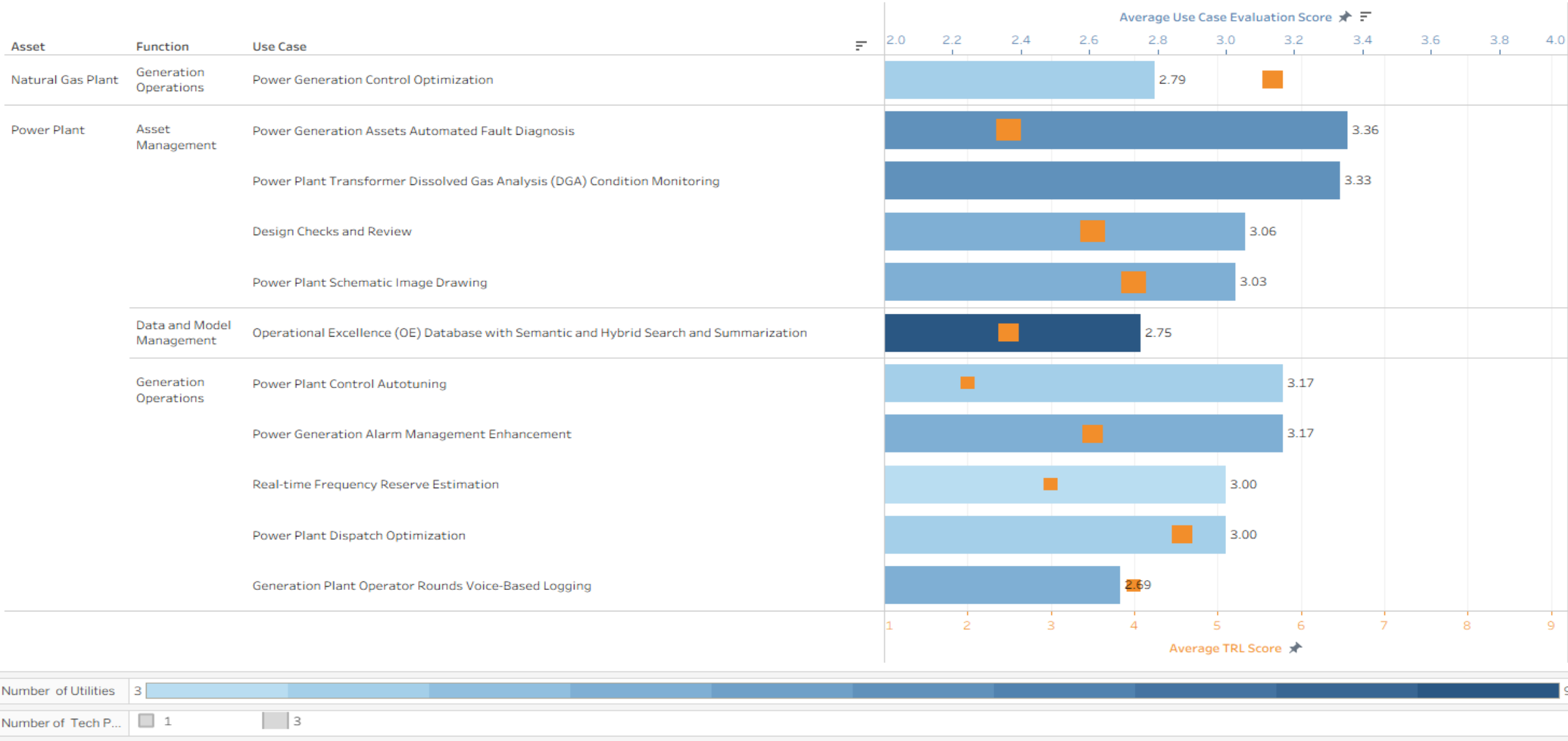
Top 15 Use Cases - Nuclear Power Plant

Top 15 Use Cases - Nuclear Power

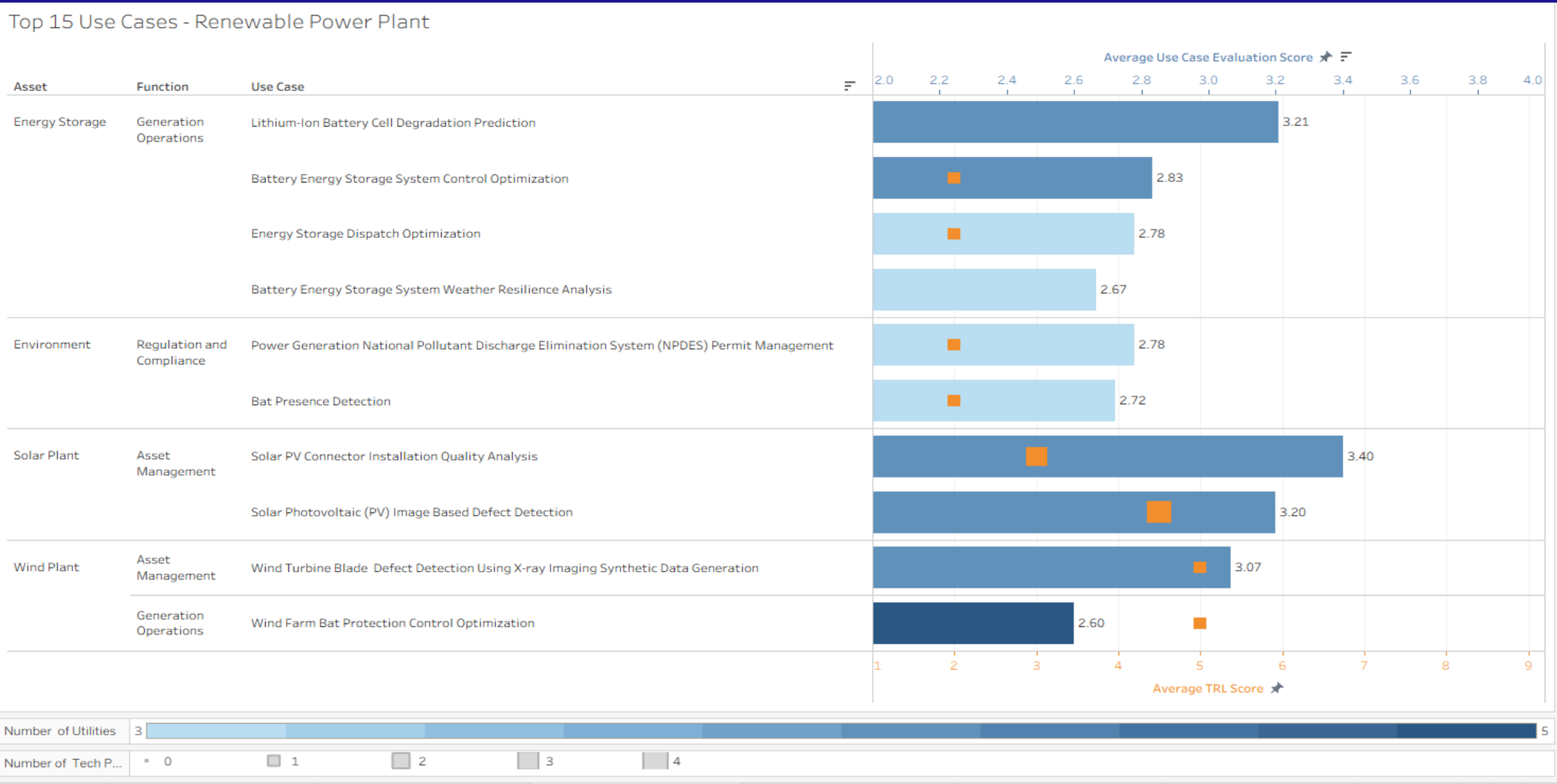


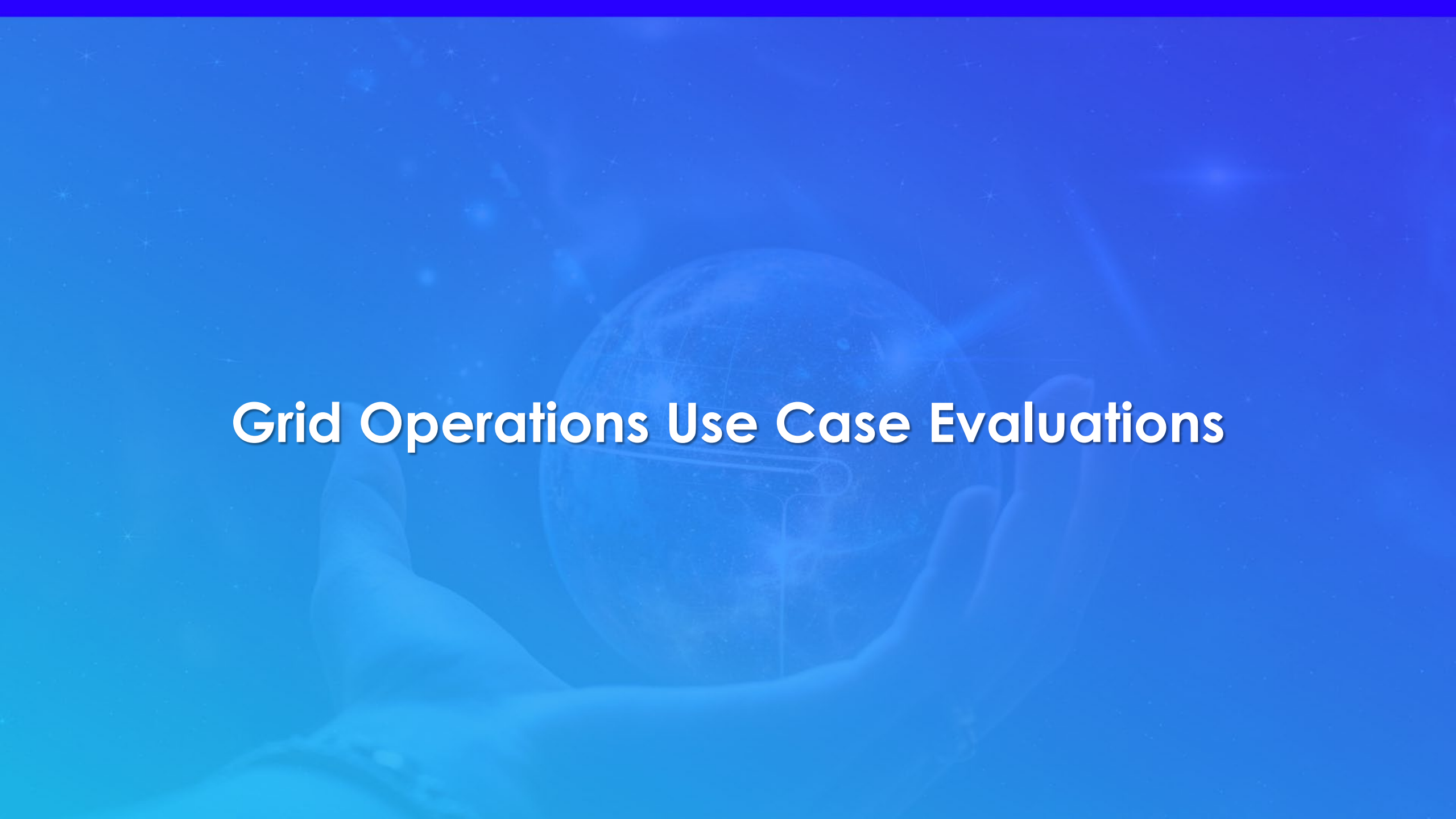
Top Use Cases - Conventional Thermal Power Plant

Top 15 Use Cases - Thermal Power Plant



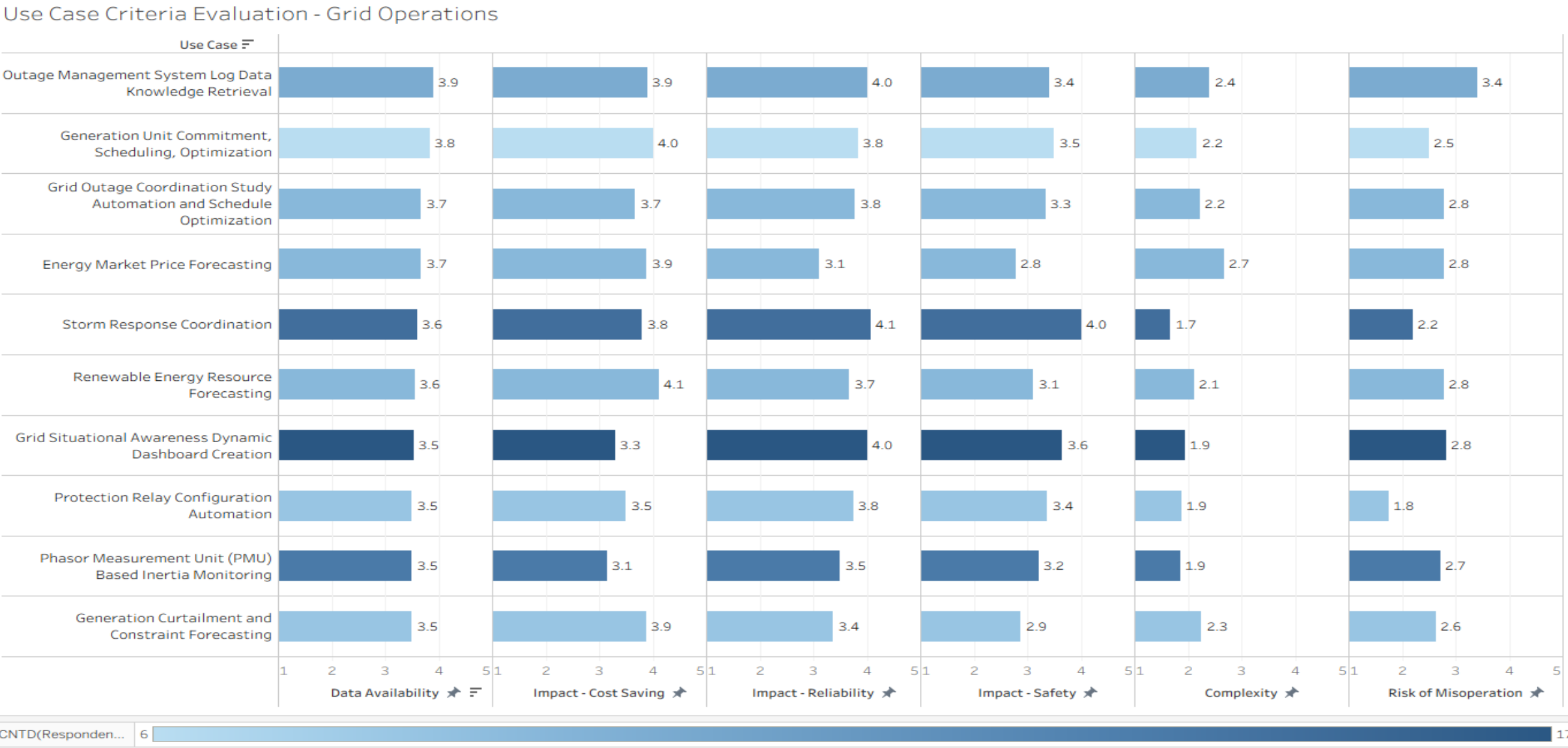
Renewable Power Plant





Grid Operations Use Case Evaluations

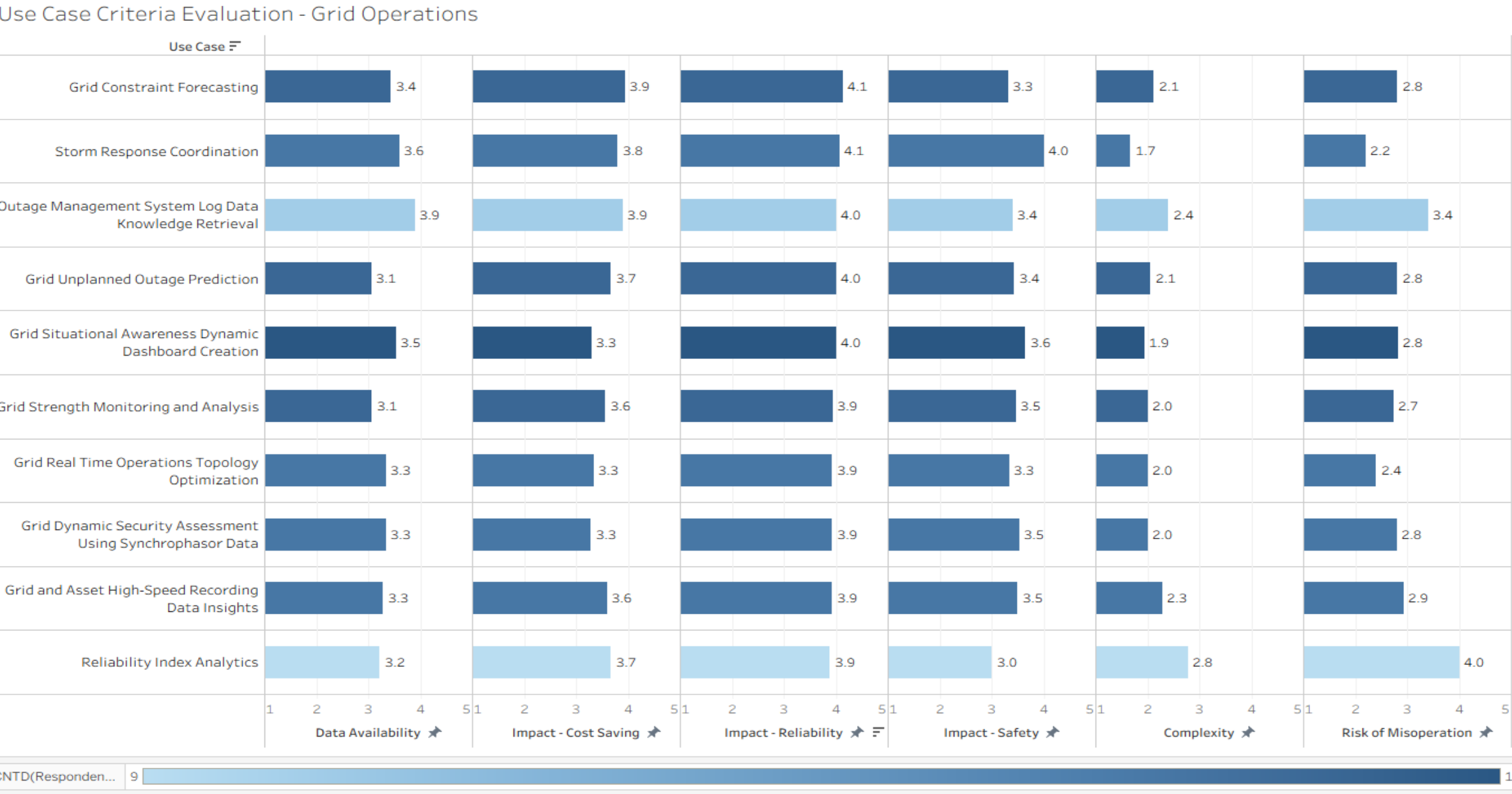
Grid Operations Use Cases Survey - Sorted By Data Availability



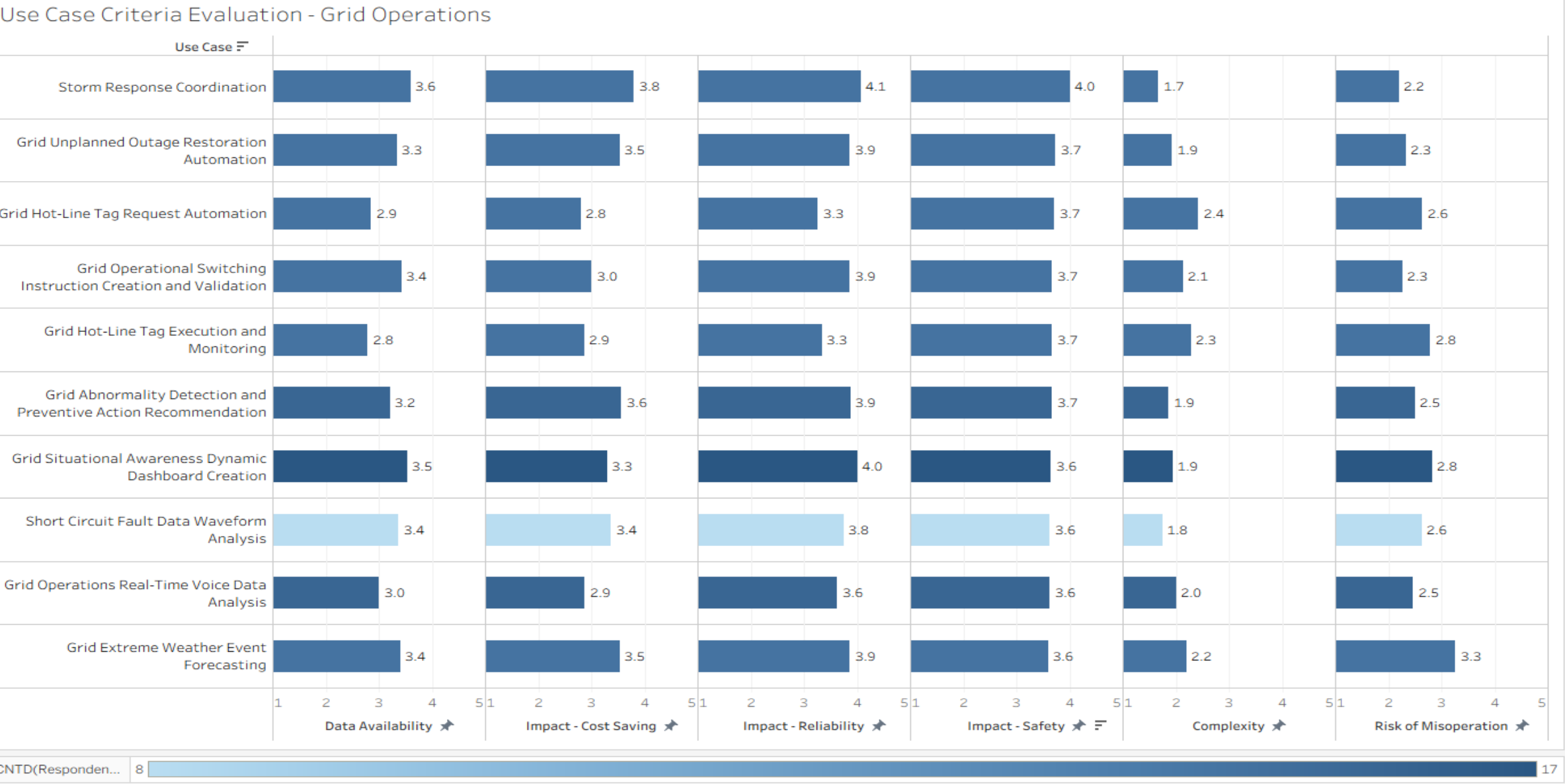
Grid Operations Use Cases Survey - Sorted By Impact Costs



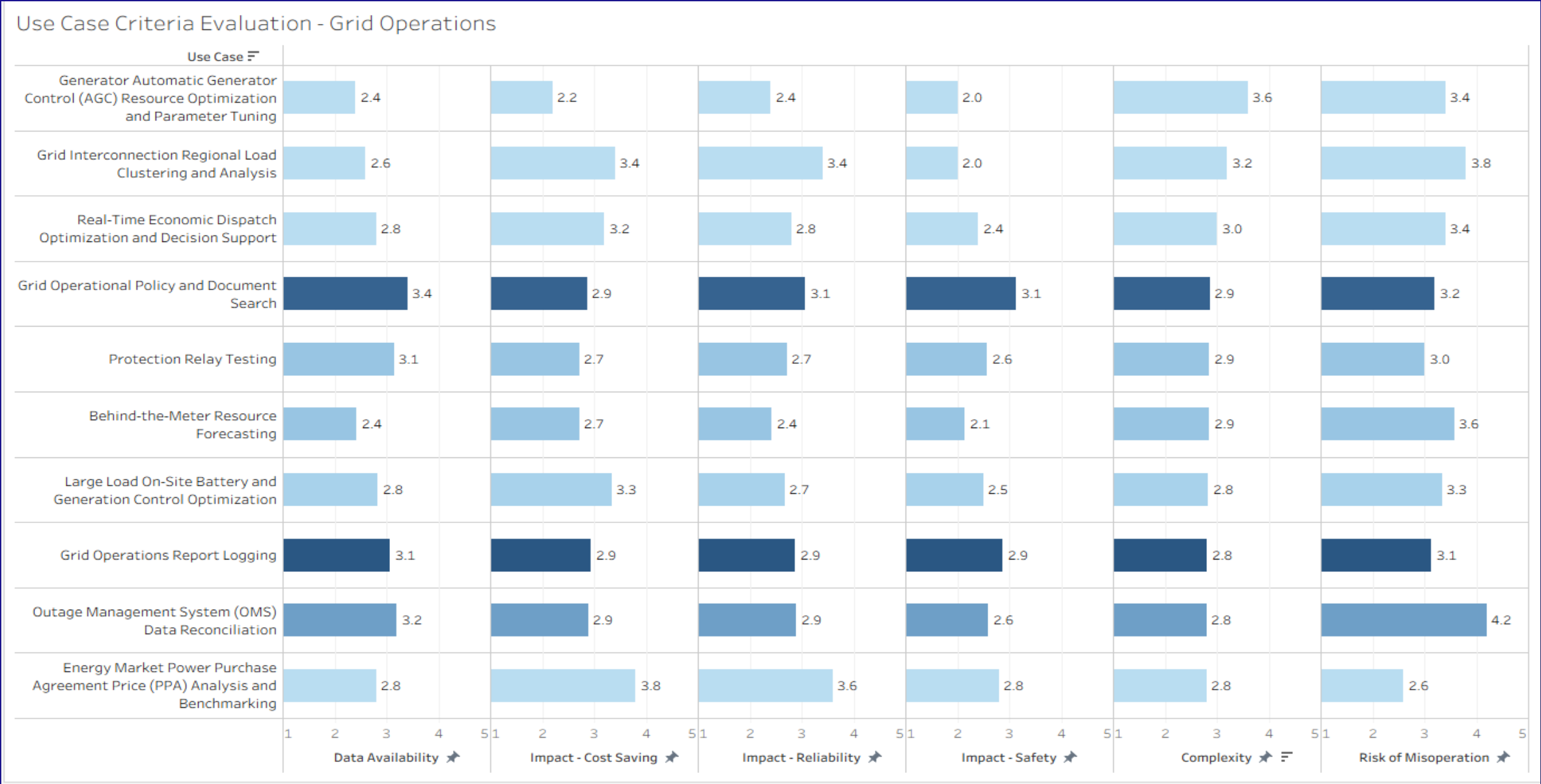
Grid Operations Use Cases Survey - Sorted By Impact Reliability



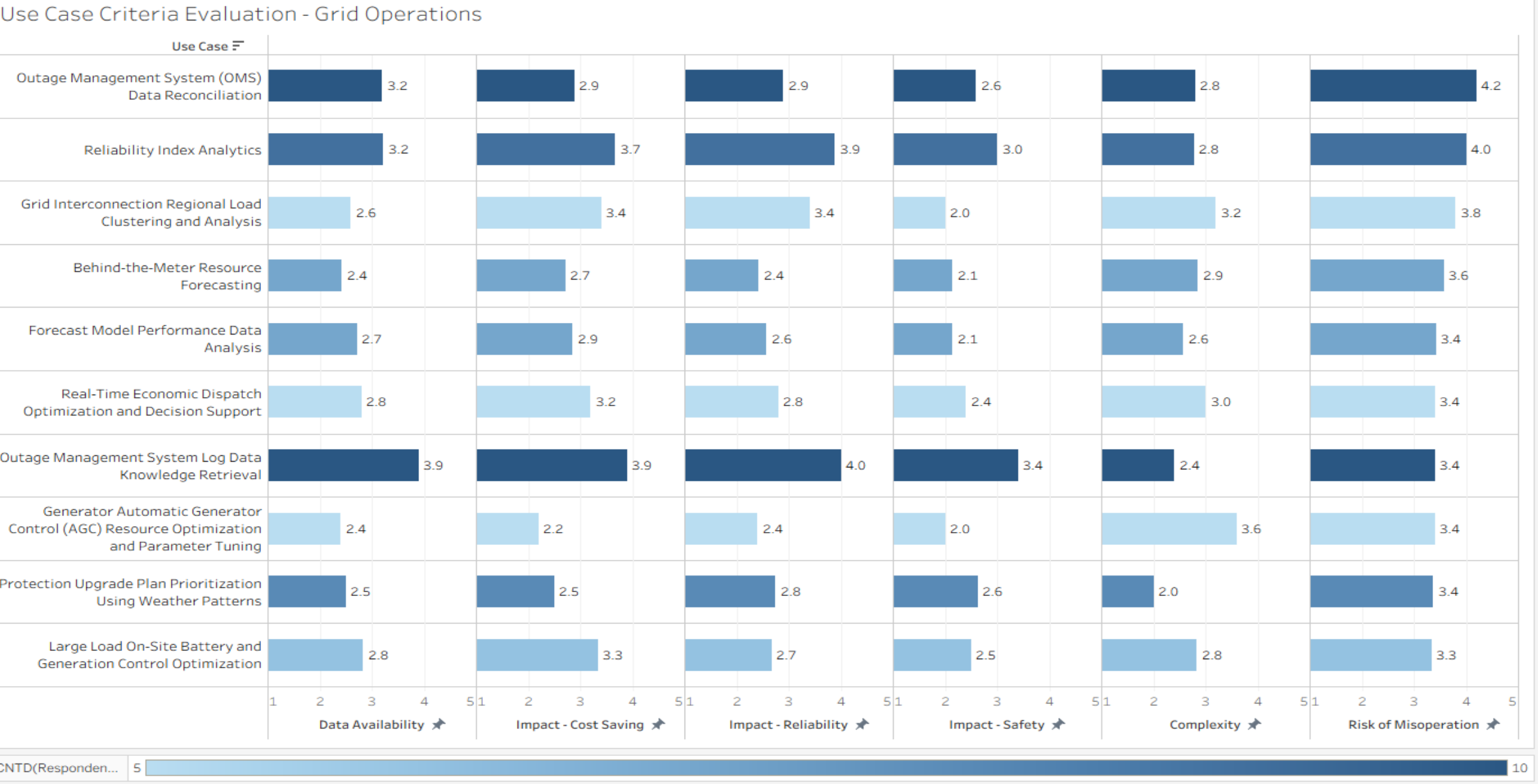
Grid Operations Use Cases Survey - Sorted By Impact Safety



Grid Operations Use Cases Survey - Sorted By Complexity



Grid Operations Use Cases Survey - Sorted By Risk of Misop





Outputs from Survey

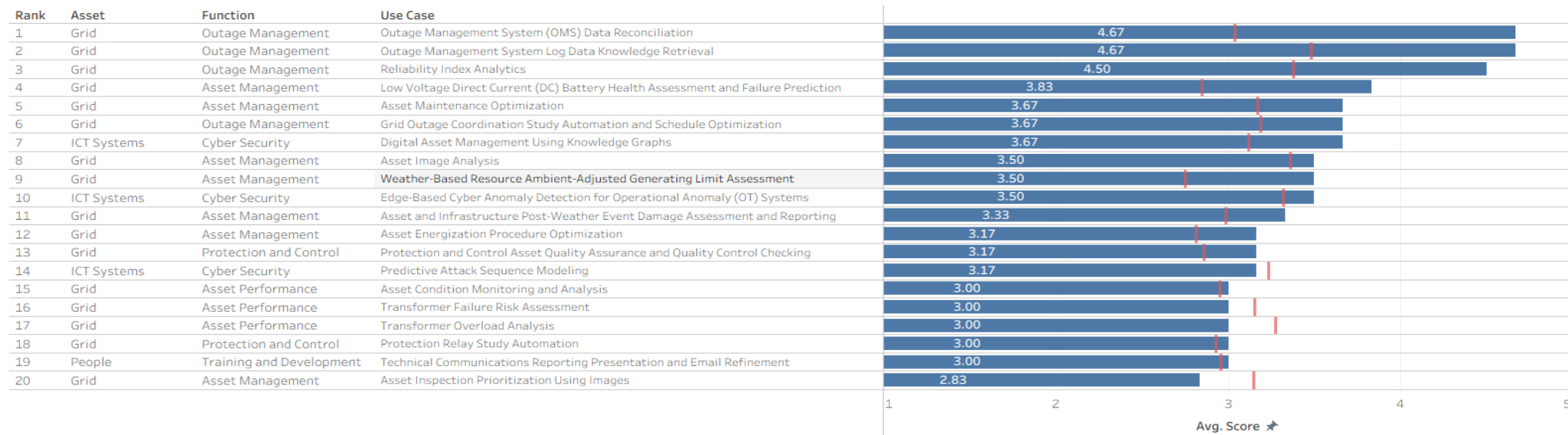
What's Your Reward for Filling in the Survey?



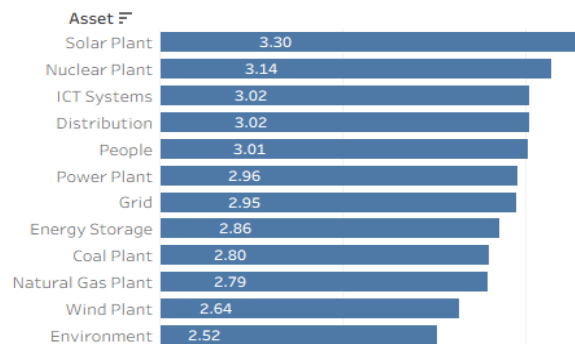
OPAI Use Case Survey Report - February 2026:

Your Utility Use Case Priority Summary

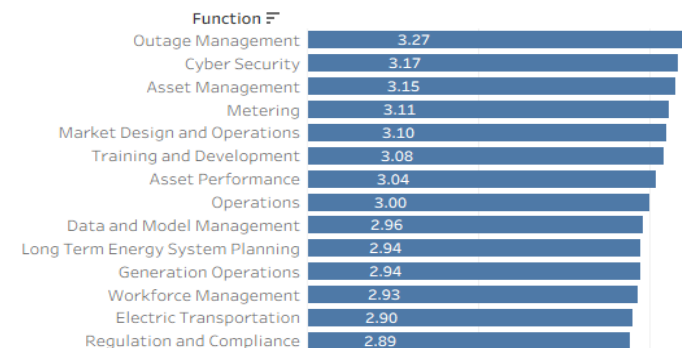
Top 20 Use Cases - **With Industry Benchmark**



Top 15 Use Cases Per Asset

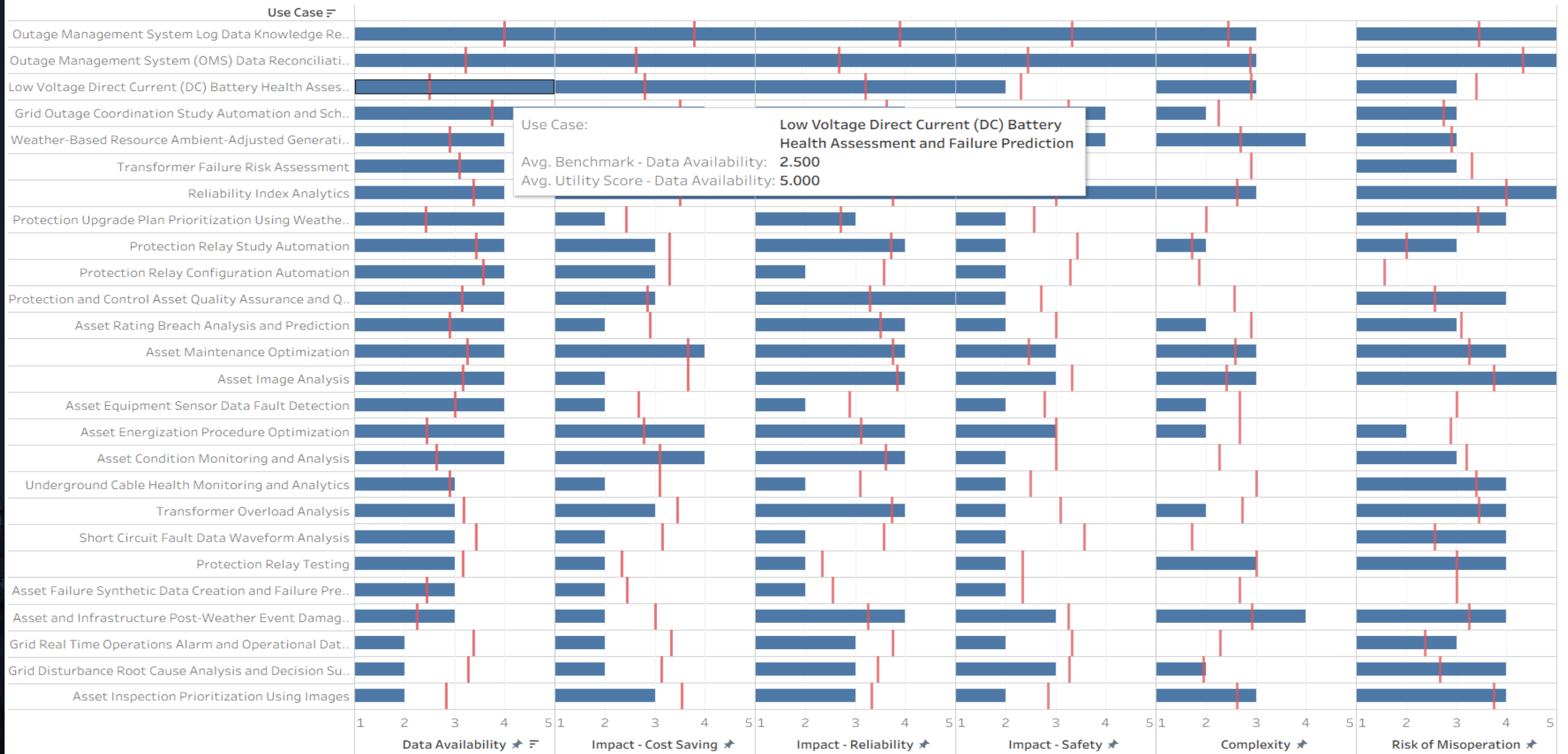


Top 15 Use Cases Per Function



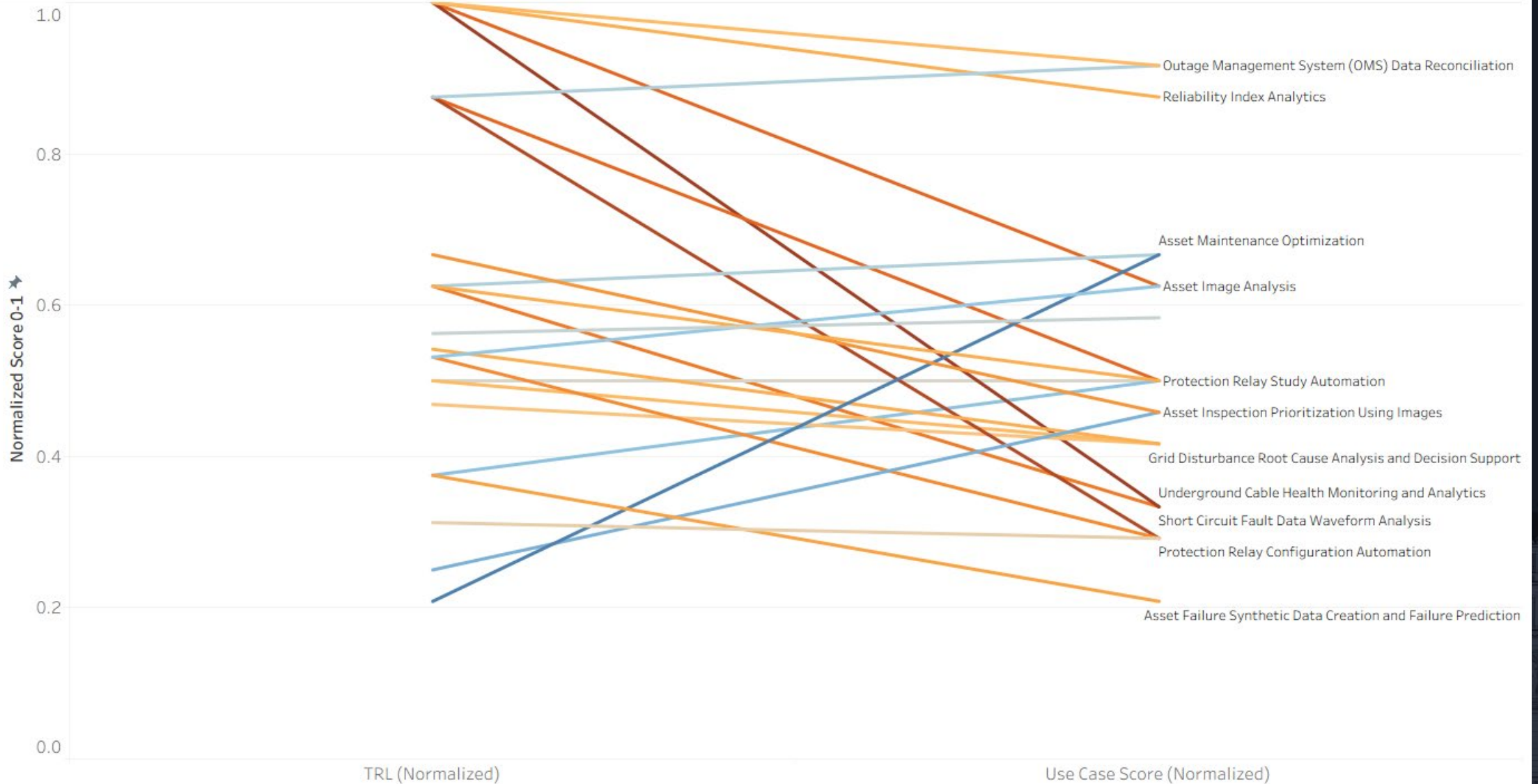
What's Your Reward for Filling in the Survey?

Use Case Criteria Evaluation - Relative to Industry Benchmarks



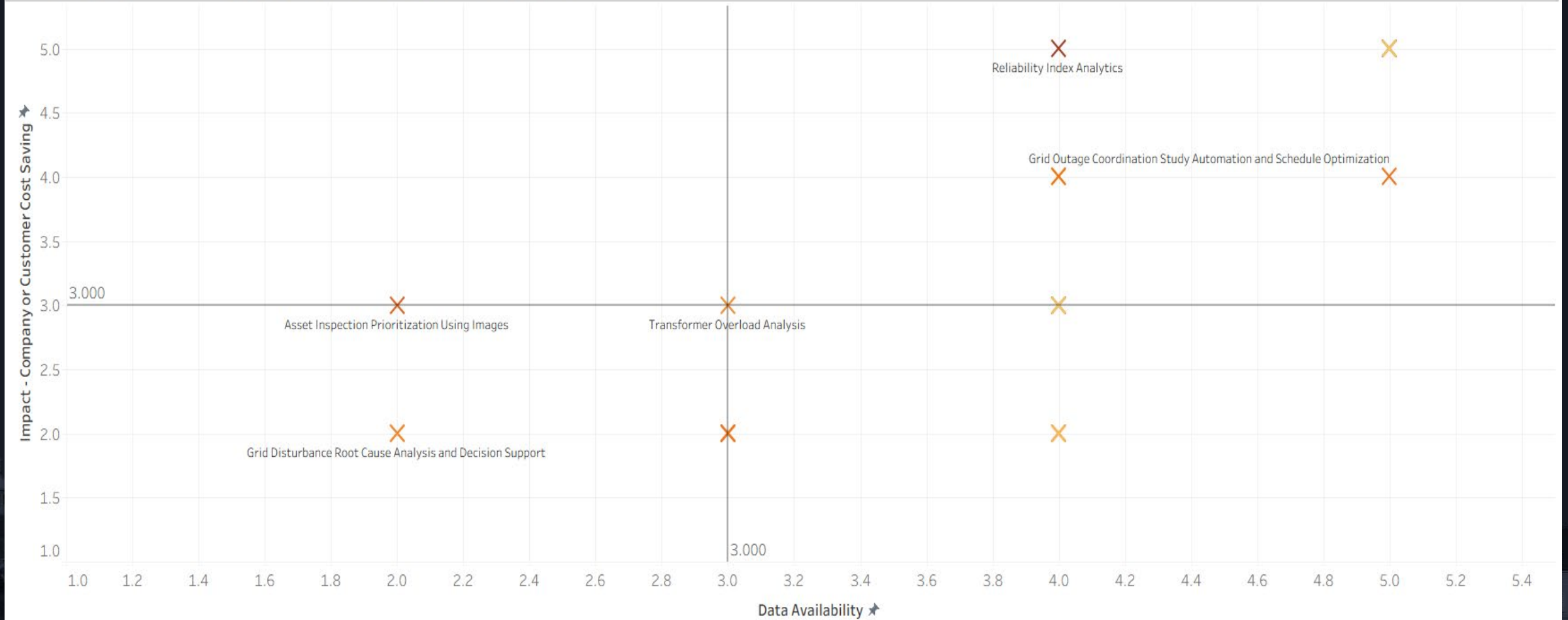
What's Your Reward for Filling in the Survey?

Slope Chart Normalized TRL - Normalized Use Case Score



What's Your Reward for Filling in the Survey?

Use Case Matrix - Impact on Costs to Data Availability



X-Axis Selection Data Availability

Y-Axis Selection Impact - Company or Customer Cost Saving

AVG(TRL Score) 2.667

9.000



TOGETHER...SHAPING THE FUTURE OF ENERGY®