aws PUBLIC SECTOR SYMPOSIUM

BRUSSELS | MARCH 28, 2023

BIT102

Accelerating Your Sustainability Transformation with the AWS Cloud

Tobias Kederer (he, him)

Senior EMEA Practice Manager, Sustainability, Professional Services

AWS

Agenda

Overview of Sustainability

Sustainability Market Snapshop

Sustainability through AWS

How to get Started & Accelerate

Case Studies

Q&A

Overview of Sustainability

Climate Crisis

- Current Polices: 3 Degrees Celsisus

- Goal: 1.5 C per Paris Agreement

- Carbon Neutral by 2050

- Cut GHG emmissions in half each decade

- This decade is CRITICAL

- New Tailwinds: Regulations to invest € billions with mandate to use % for climate-related projects

Further and Faster, Together

- Commitment to a sustainable future

- Net-zero carbon 10 years earlier (2040)

- Path to 100% renewable energy by 2025

- $2 billion Climate Pledge Fund

THE CLIMATE PLEDGE — Paris… 10 years Early

Amazon Journey Highlights

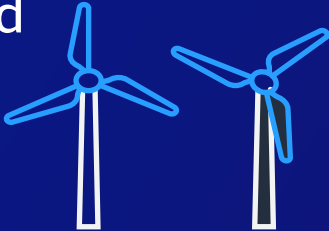Published 1st, 2nd, and 3rd annual sustainability report

Reduced weight of outbound packaging by 36% & eliminated over 1 million tons of packaging

Ordered 100,000 Rivian electric delivery vehicles

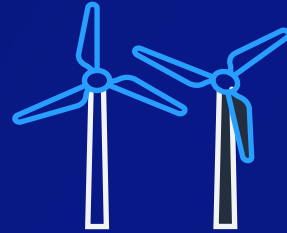Amazon becomes largest corporate buyer of renewable energy in the world

Echo and Fire devices get energy-saving low-power mode, recycled materials, & secure renewable energy to offset use of Amazon devices
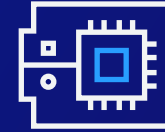
AWS Journey Highlights

Water stewardship: evaporative cooling, recycled water, and onsite water treatment; Water positive by 2030!

Renewable energy to power data centers

Graviton3 processors provide better performance per watt than any other AWS processor
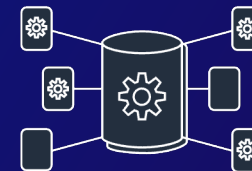
Removing central UPS reduces energy conversions, optimizations on the racks reduce energy use

New data center construction incorporates use of low-carbon concrete

Amazon Sustainability Data Initiative (ASDI) provides free access to satellite data and climate models

aws

Sustainability Market Snapshop

Macro Trends Driving Sustainability

Employees, consumers, governments, and communities expect the private sector to do more than maximize profits, increasingly creating a world where doing good is also good for business.

Customer Demand	1	
Reputational led ESG focus	2	
Activism-led Investing	3	
Government Regulations	4	
Employee Demand	5	
Sustainability as Competitive Positioning	6	

European Governments have a Once-In-A-Century Opportunity to Deliver Net-Zero Economies & Environments

Convenient, affordable, safe, and environmentally sustainable mobility

Livable and prosperous cities

Net-zero economy and resource conservation

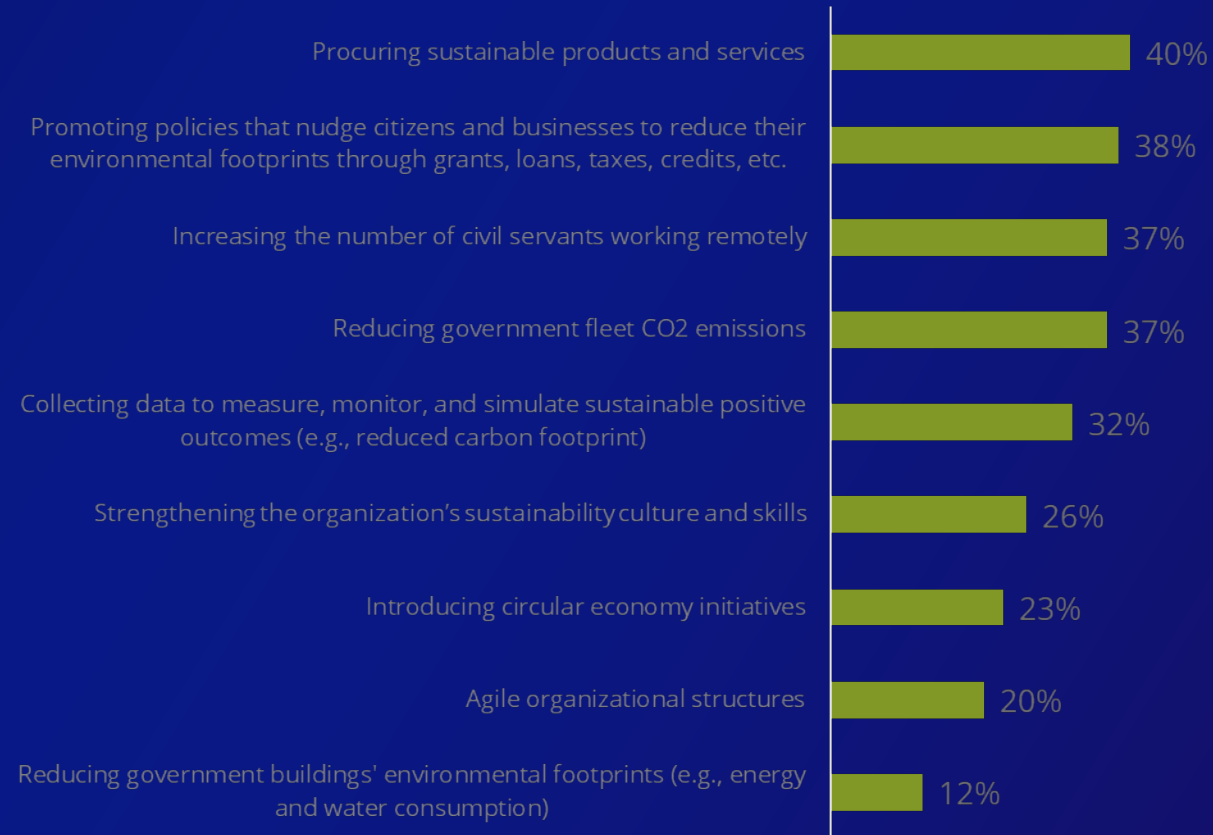Affordable, net-zero housing

Resilient, high-yield infrastructure

Source: IDC's *European Government Insights Survey*, July 2022 (n = 65)

Many Initiatives are Linked to Sustainability

Q. What are the key actions your organization is taking to execute on its environmental program? (Choose up to 3)

- First priority is procurement of adequate products and services. Other actions focus on reducing environmental impact of operations, such as remote work or a reduction of the fleet's CO_2 emissions.

- EU governments have the power to promote actions for the general population such as grants, loans, and taxes.

- Long-term actions are at bottom of the priorities. It is a surprise to see energy and water consumption as the last option considering inflation.

Key Actions to Execute Environmental Sustainability Programs

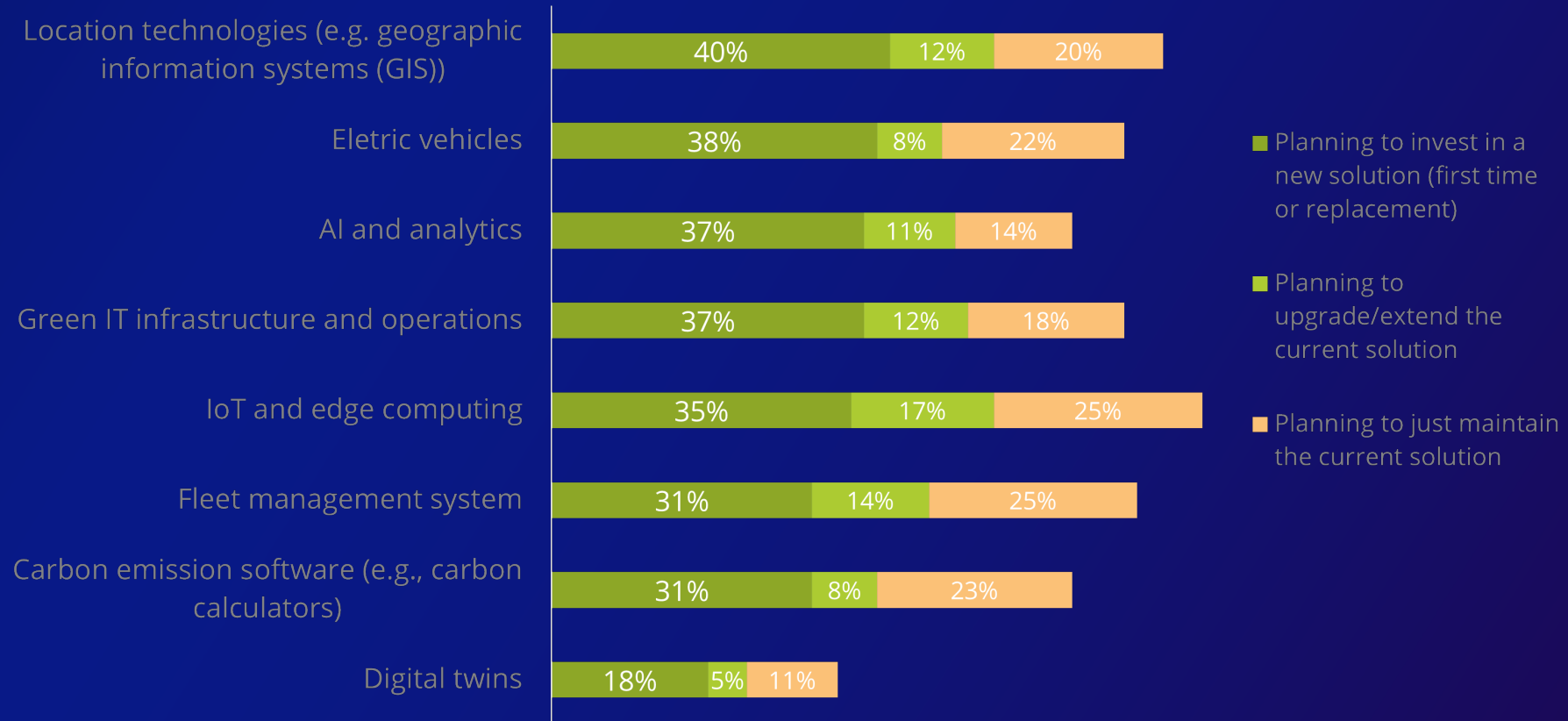| Action	Percentage
Procuring sustainable products and services	40%
Promoting policies that nudge citizens and businesses to reduce their environmental footprints through grants, loans, taxes, credits, etc.	38%
Increasing the number of civil servants working remotely	37%
Reducing government fleet CO2 emissions	37%
Collecting data to measure, monitor, and simulate sustainable positive outcomes (e.g., reduced carbon footprint)	32%
Strengthening the organization's sustainability culture and skills	26%
Introducing circular economy initiatives	23%
Agile organizational structures	20%
Reducing government buildings' environmental footprints (e.g., energy and water consumption)	12%

Source: IDC's *European Government Insights Survey*, July 2022 (n = 65)

Many Investments to Come to Support Sustainable Initiatives

Q. What are your organization's plans regarding the use of critical technology capabilities and solutions over the next 18 months?)

- Many technology initiatives can help reduce global government footprints, and priorities are different across countries.

- Location technologies are popular everywhere, but EVS are a priority in Southern Europe.

- Nordic countries are keen on green IT and carbon emission software, while UK and other major countries are interested in digital twin development.
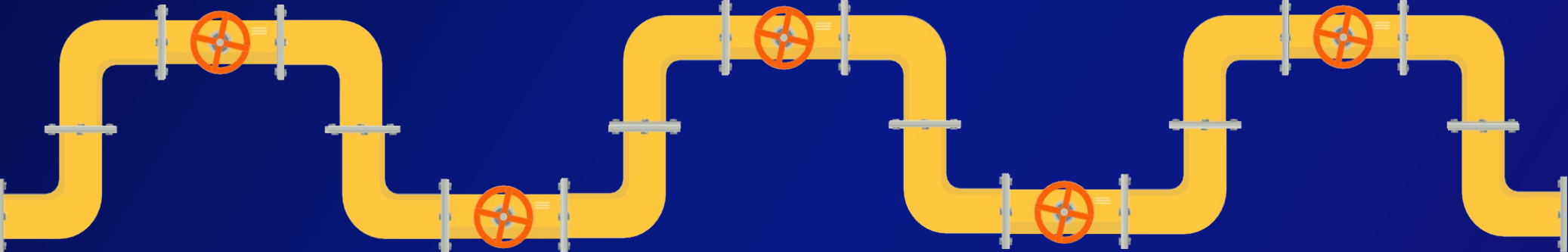
Use of Technology to Support Environmental Sustainability Programs

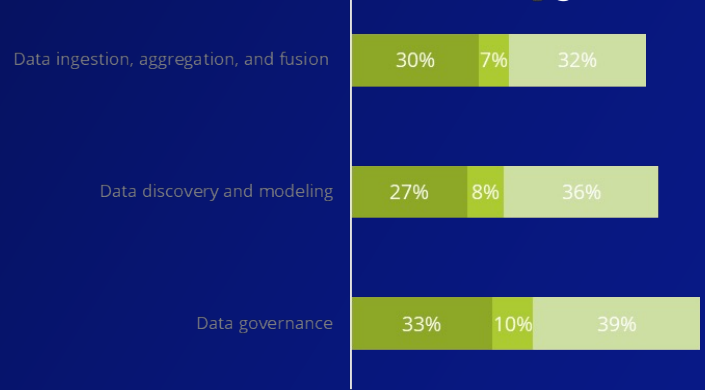| Technology	Planning to invest in a new solution (first time or replacement)	Planning to upgrade/extend the current solution	Planning to just maintain the current solution
Location technologies (e.g. geographic information systems (GIS))	40%	12%	20%
Eletric vehicles	38%	8%	22%
AI and analytics	37%	11%	14%
Green IT infrastructure and operations	37%	12%	18%
IoT and edge computing	35%	17%	25%
Fleet management system	31%	14%	25%
Carbon emission software (e.g., carbon calculators)	31%	8%	23%
Digital twins	18%	5%	11%

Source: IDC's *European Government Insights Survey*, July 2022 (n = 65)

Majority of EU Governments will Invest in Data and Analytics, from Ingestion to Processing
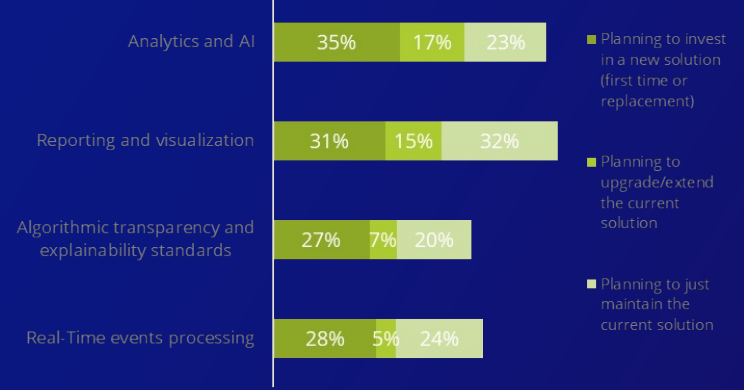
Data Management

Data ingestion, aggregation, and fusion	30%	7%	32%
Data discovery and modeling	27%	8%	36%
Data governance	33%	10%	39%

Interoperability

Data exchange	33%	7%	21%
API management	23%	11%	37%
Open data	36%	9%	22%
Linked data	25%	7%	24%
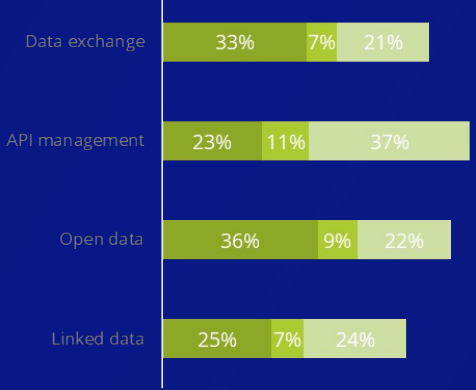
Data Extraction & Visualization

Analytics and AI	35%	17%	23%
Reporting and visualization	31%	15%	32%
Algorithmic transparency and explainability standards	27%	7%	20%
Real-Time events processing	28%	5%	24%

- ■ Planning to invest in a new solution (first time or replacement)
- ■ Planning to upgrade/extend the current solution
- ■ Planning to just maintain the current solution

Source: IDC's *Data Integration and Integrity End-User Survey*, 2019 (n = 300); IDC's *European Multicloud Survey*, 2020 (n = 1,187); IDC Europe's Custom Data Research, 2020

Private Sector – Every Industry is Affected

Disclosures shifting from transparency to accountability with quality reporting at the center to help address decarbonization

Top industries driving efforts

- Building & Construction
- Financial Services
- Manufacturing
- Transportation
- Healthcare (Life Sciences)
- CPG/Retail

Sustainability Drives Business Growth

"**Tomorrow's strongest businesses are likely to be the Twin Transformers' – companies that find the new value at the intersection of digital technologies and sustainabity. Powered by these twin engines of growth, they're 2.5 x more likely to outperform their peers.**"

Accenture
April 2021

2.5x outperform

Sustainability Through AWS

AWS as your Partner in Sustainability

Migrate
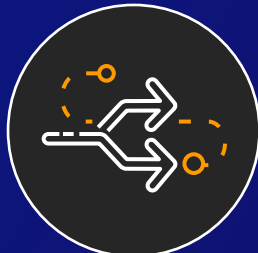Take advantage of the cloud and AWS efficiency

A carbon reduction opportunity

Optimize
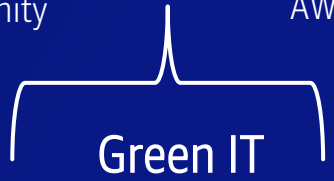Optimize your workloads with Well-Architected for sustainability

AWS Customer Carbon Footprint Tool

Transform
Leverage data, Partners/ AWS Professional Services, and digital innovation

AWS Sustainability Practitioners and Partners

Green IT

It's More Sustainable in the cloud

Migrate

Foundation to Innovate

Optimize

AWS's infrastructure is
3.6x more energy efficient
than the median of surveyed U.S. enterprise data centers

AWS performs the same task with an
88% lower carbon footprint

Customer Carbon Footprint Reporting (AWS Console)

Sustainability Pillar for the Well-Architected Framework

- **National Biodiversity Network (UK) with Partner CirrusHQ**

aws

AWS as your Partner in Sustainability

Decarbonize the Business

Reduce Environmental Impacts (non-carbon)

Sustainability Strategy & Product Development

Migrate

Take advantage of the cloud and AWS efficiency

A carbon reduction opportunity

Optimize

Optimize your workloads with Well-Architected for sustainability

AWS Customer Carbon Footprint Tool

Transform

Leverage data, AWS professional services, and digital innovation

AWS Sustainability Practitioners and Partners

Accelerate outcomes THROUGH the Cloud

Data is Core to Addressing the Climate Crisis

Growing exponentially

From new sources

Increasingly diverse

Used by many people

Analyzed by many applications

MEASURE

MONITOR

MANAGE

How to Get Started and Accelerate

Accelerate Sustainability via AWS Technogloy Solutions, Sustainability Experts and Partners

We take a **data-driven** approach to accelerate sustainability outcomes, for our **customers** and for our **planet**.

Sustainability Strategists

Frameworks, regulations, global goals

AWS Services

Sustainability strategy alignment
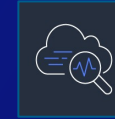
Sustainable targets & initiative advisory support
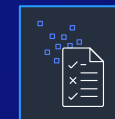
Carbon Footprint disclosures & reporting frameworks

Sustainable operations and building management

Operational efficiencies and resource management

Sustainable innovation & development

Supply chain transparency and engagement

Sustainability Data: Open & Commercial Data

Open Data Program

Amazon Sustainability Data Initiative

AWS Data Exchange

Data to address a wide range of sustainability challenges

Sustainable Transformation with Data

Enabling customers at every stage in their sustainability journey to leverage the cloud and accelerate their sustainable targets

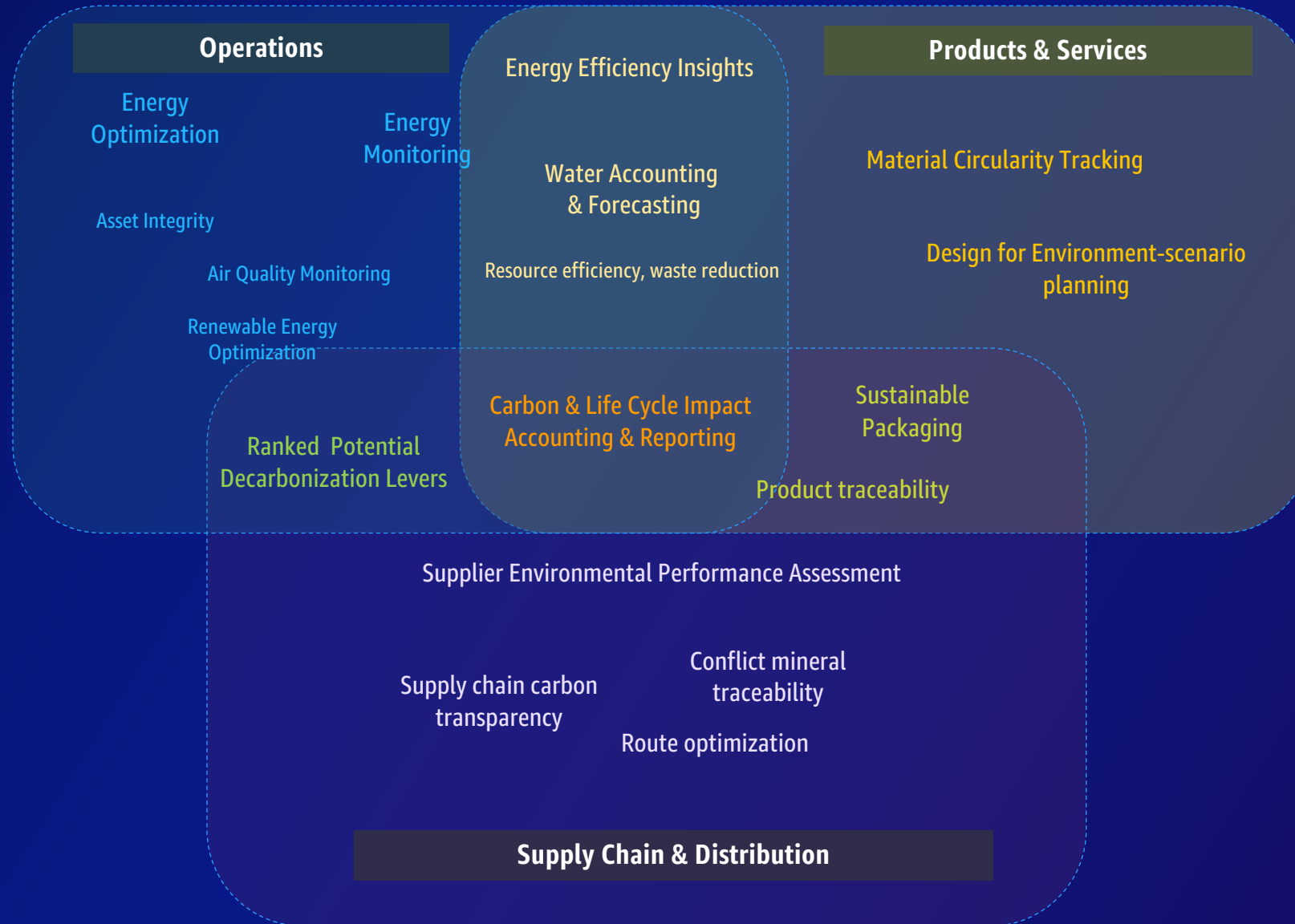| ASSESSING	DEVELOPING	DEPLOYING	EXPANDING
Organizations at the BEGINNING of their sustainable journey	Organizations COMMITTING to a sustainability strategy	Organizations REPORTING on sustainability initiatives	Organizations ENHANCING their sustainable impact
Organizations seeking to define or align on a sustainable strategy (true north). Often, this includes organizations with limited to no specialty knowledge or resources responsible for sustainable delivery. These organizations are seeking guidance on where they should be focused to maximize impact.	Organizations with sustainable commitments and/or an aligned strategic focus, but limited on deployment mechanisms. This may include the absence of an executional roadmap, internal resources or processes, or uncertainty on ways to help accelerate delivery of their commitments.	Organizations with internal, manual processes and systems to produce reports on sustainable metrics, as related to their overall commitments. Often, the reporting compilation includes siloed data. These organizations may seek centralization, automation, and better scalability of their data for deeper insights and analysis.	Organizations well into their sustainability journey with efficient reporting mechanisms, scalable infrastructure, and data integrity safeguards. Organizations seeking expansion often look to leverage data to optimize processes, introducing advanced technical approaches (e.g., AI or ML) to enhance predictive insights and drive prescriptive action.

Stage

Maturity

Sustainable Definition	Sustainable Transformation

Journey

Recognize	Manage	Report	Integrate	Optimize

Accelerate your Sustainability Agenda on AWS

Operations

Energy Optimization

Energy Monitoring

Asset Integrity

Air Quality Monitoring

Renewable Energy Optimization

Ranked Potential Decarbonization Levers

Energy Efficiency Insights

Water Accounting & Forecasting

Resource efficiency, waste reduction

Carbon & Life Cycle Impact Accounting & Reporting

Products & Services

Material Circularity Tracking

Design for Environment-scenario planning

Sustainable Packaging

Product traceability

Supplier Environmental Performance Assessment

Supply chain carbon transparency

Conflict mineral traceability

Route optimization

Supply Chain & Distribution

ILLUSTRATIVE

Think Big, Start Small, then Accelerate

Discovery

Proof Of Value

Sustainable Innovation

Scale

Sustainability strategy and transformation planning

1 Establish Strategy and Benchmarks

2 Define Goals, Teams, and Deliverables

3 Implement, Optimize, and Expand

4 Automated Reporting, and Stakeholder Outreach

- IT Leads
- Business & Executional Leads
- Sustainability Leads

AWS Sustainability SMEs supports your sustainability strategy through data

Outcomes tied to your strategy, markets, and customers

1 **2** **3** **4**

Integration Partners
AWS Sustainability Practitioners

Resources

AWS Sustainability Website
https://aws.amazon.com/sustainability/
Review case studies, customer use cases and sustainability resources

AWS Sustainability Practitioners
Leverage sustainability technologists and solutions and innovate across your business

Build with AWS Services and Partner Solutions
Identify use cases, select AWS technologies & partners

Amazon Sus Data Initiative AWS Data Exchange
Find sustainability data sets for research & innovation

Customer Sustainability Case Studies on AWS

Innovation Needed

"With the application of alternative approaches, 100% of annual CO2 emissions could be mitigated."

-U.S. Department of Energy
"Industrial Decarbonization Roadmap," 2022

Energy Efficiency

Low-carbon fuels, Feedstocks, & Energy Sources

Industrial Electrification

Carbon capture, utilization, & storage

IBM

ORIS

An artificial intelligence-based digital platform helps shrink the carbon footprint of road construction while building more resilient and cost-effective roadways.

Paving a half-mile (1 km) of a four-lane highway requires **40,000 tons of materials** and produces at least **1,300 tons of CO_2**

Project Highlights

Think Big

IBM worked with ORIS to build the platform as a series of containerized applications using Amazon Elastic Kubernetes Service (Amazon EKS), so it can be scaled globally and efficiently. This enabled ORIS to support road projects in Azerbaijan, France, Mexico, and the United Kingdom. And it will expand to support rail, waterways, and more.

Deliver Results

ORIS helps reduce overall road project costs by up to 30 percent, decreased overall carbon emissions by up to 50 percent, and lowered the use of natural resources by up to 80 percent by tripling road lifespan.

Towards resilient and sustainable infrastructures

Automatically acquired and **connected** all necessary data for each unique project on a **single platform** and **provide insights and recommendations** to various stakeholders.

Calculation of total CO_2 emissions of a road construction projects

Prediction of future maintenance costs

Recommendation of locally available (and sometimes recycled) materials from a database of more than 30,000 suppliers.

Inawisdom,
a Cognizant
Company

ACTIS

Actis and Inawisdom use machine learning on AWS to brighten the renewable energy future.

Global demand for **electricity** is expected to **double** in the next 2 decades.

Project Highlights

Think Big

Using AWS IoT Greengrass, the new Actis data platform can ingest over 63 million data points each day and run an estimated 7 million machine learning predictions. In other words, a galaxy's worth of data can be analyzed, shared, and converted to action.

Bias for Action

Inawisdom, a Cognizant Company, launched the data platform and the application in roughly 12 weeks, on time and on budget, but delivery doesn't stop there. The tools provided make it easier for Actis teams to rapidly share ideas, develop future proof of concepts, and help improve performance value.

Broad Responsibility

With about 10 million solar panels in the Actis portfolio—laid flat they could stretch almost half-way around Earth—even small adjustments can add up to enormous impact. Focusing on precise data-driven improvements, Actis demonstrates what sustainability as a core value can achieve.

Optimizing solar energy begins with a brighter data analytics strategy

Data Platform that helps identify every opportunity to **optimize performance** of solar forms.

Collate data 24/7 from sensors on solar installations around the globe

---

Machine learning to surface **insights** for investors and operators in an easy-to-access online portal.

Foresee equipment issues and even **predict** solar panel output.

Climate Next
Technologies for Sustainability

Zanzibar: The Essential Mangrove

How Tanzanian communities are using satellite imagery data to restore mangroves

Mangroves play an essential role in protecting communities from the impacts of climate change. Discover how student-led YouthMappers and Digital Earth Africa enable African communities to track continental changes in unprecedented detail by making Earth observation (EO) data more easily accessible in the cloud.

London: Driving Toward Cheaper, Cleaner Power

How Octopus Energy is using technology to deliver renewable energy to consumers

Burning fossil fuels releases large amounts of carbon dioxide into the atmosphere, resulting in extreme weather conditions and a warmer planet. Explore how Octopus Energy uses their smart grid technology to provide access to cheaper electricity and renewable energy.

https://aws.amazon.com/sustainability/climatenext/

Thank you!

Tobias Kederer [in]

tkederer@amazon.com

Please complete the session survey in the mobile app

Thank you for everything you are doing to give our beautiful planet a fighting chance for survival

aws