



Microsoft Azure Digital TWINS

Julie Morin – Julie.Morin@Microsoft.com
Canada IOT GBB Solution Specialist

Power
is the key ingredient



Commitment to sustainability



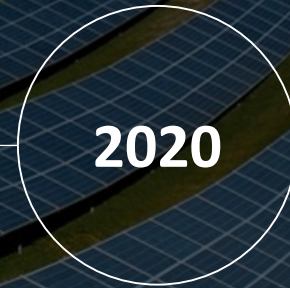
2012

Carbon
neutral



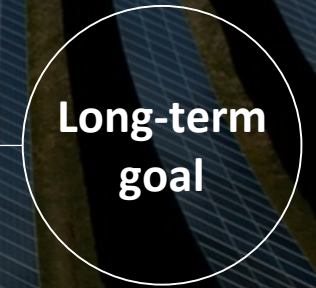
2018

50% energy
use from
wind, solar &
hydropower



2020

60% energy
use from
wind, solar &
hydropower



**Long-term
goal**

100% energy
use from
wind, solar &
hydropower



IOT & INTELLIGENT INFRASTRUCTURE

Remote Monitoring

Predictive Maintenance

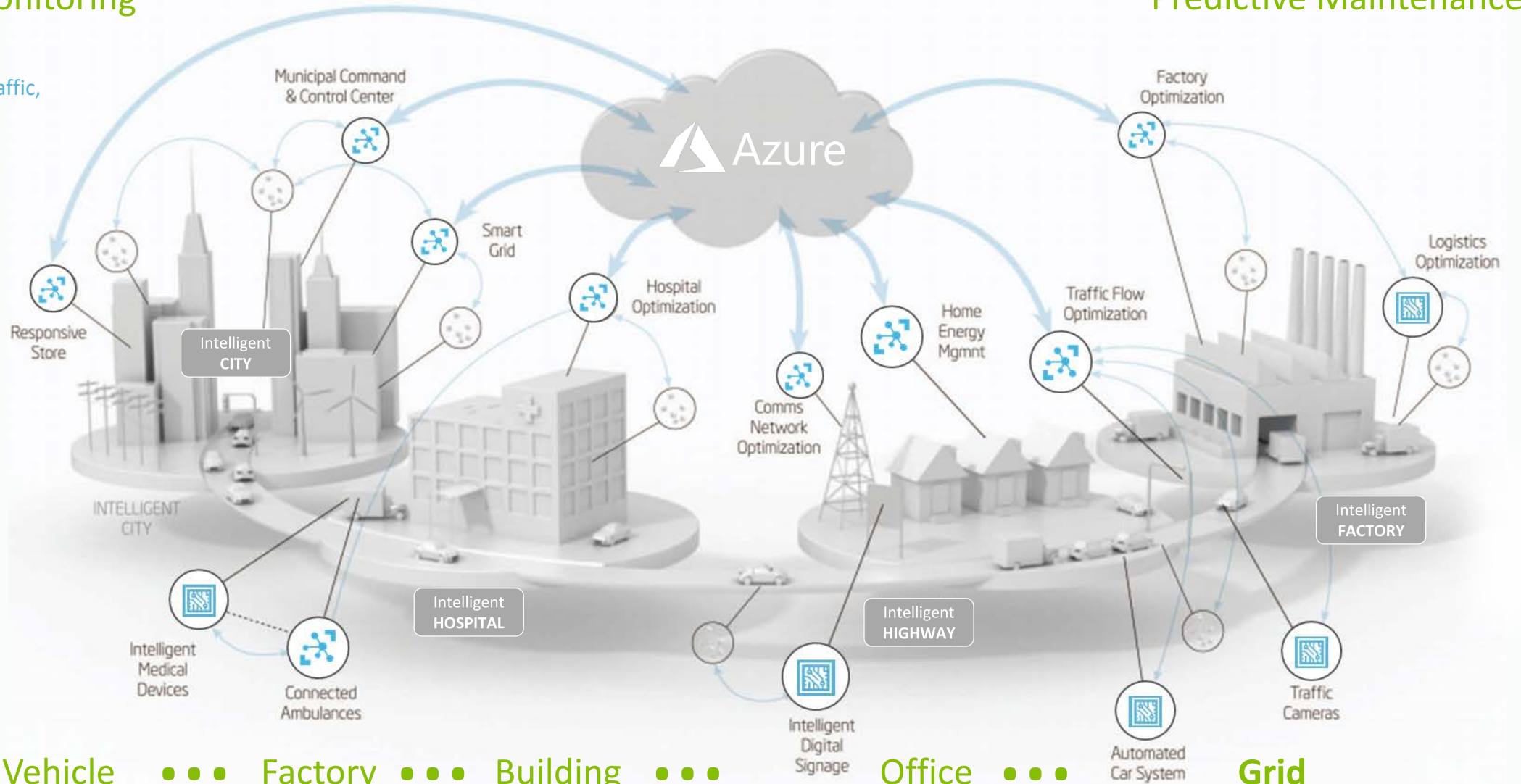
Transportation, Traffic,
Parking, Vehicles

Housing,
Buildings

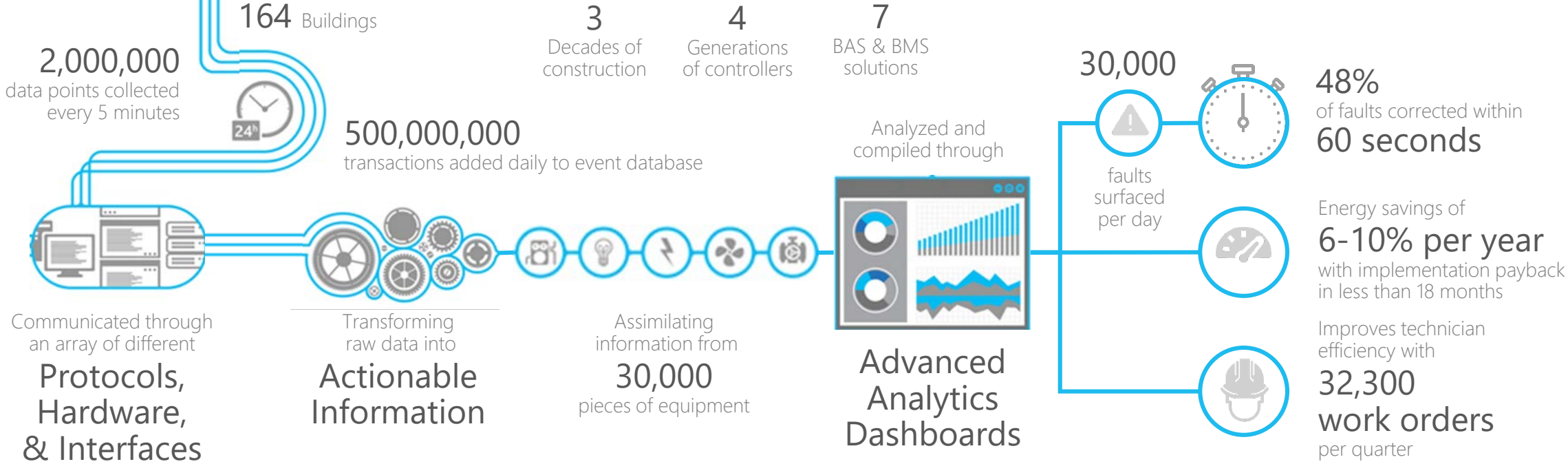
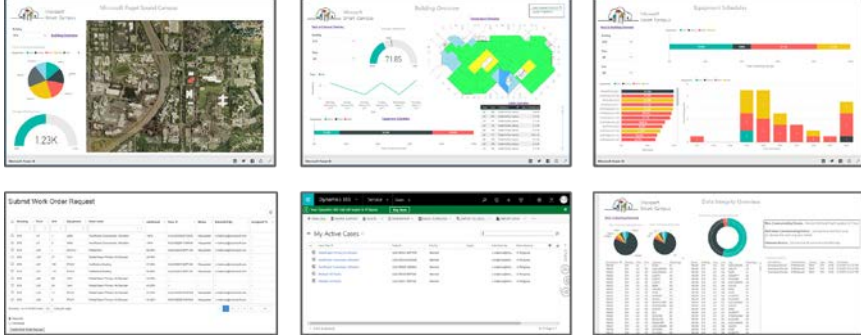
Energy,
Water
& Utilities

Citizen
Engagement

Public Safety &
Security



MICROSOFT SMART CAMPUS



WAVES OF INNOVATION

Cloud

Globally available, unlimited compute resources

IoT

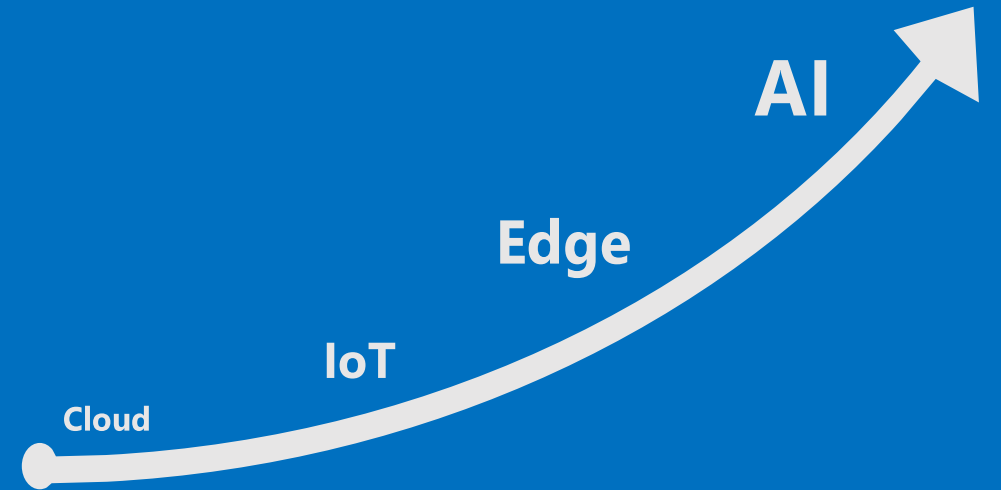
Harnessing signals from sensors and devices, managed centrally by the cloud

Edge

Intelligence offloaded from the cloud to IoT devices

AI

Breakthrough intelligence capabilities, in the cloud and at the edge



TRANSFORMATIONAL CHANGE FOR GRID

Market Forces



Renewable Energy ↑



Distributed Energy Resources ↑



IoT Devices ↑ & Digital Transformation ↑



Regulations ↑↓



Energy Price Trend ↓

Customer Challenges



Volatile Energy Demand ↑↓



Aging Grid - Investments ↑



New Scenarios ↑ (Solar, Electric Vehicle, ...)



Prediction Complexity ↑



Thermal Generation ↓ (Nuclear, Coal)

Fundamental Changes



Bidirectional flow of Electric Power



Electricity Storage (large quantity)

agder energi



agder energi

Smarter grid with Agder Energi in Norway

<https://www.youtube.com/watch?v=cxKphN8iVHE>

AGDER ENERGI

Microsoft Green Blog

How Microsoft Technology is Enabling an Autonomous Grid

May 17, 2017 | Brian Janous, Director of Energy Strategy



The electricity industry is undergoing a transformational change. In the technology sector, we have become accustomed to major shifts in our industry every few years. But if you are a utility, these disruptions are likely keeping you up at night. How do you deliver reliable energy to a more engaged and dynamic customer base when your power supply is increasingly renewable and therefore intermittent, all in a system that has not really changed since the early 1900s? Utilities have a choice – hold on tightly to a hundred-year-old business model, or embrace the disruption and transform their industry in the process.

Microsoft is betting on transformation. We believe deeply in the power of data-driven insights to create new efficiencies across every industry, especially the energy and utilities sector. What we see and hear indicates that technology can help utilities build more effective, reliable and autonomous grids. Much like how self-driving cars will transform the hundred-year-old auto industry, a self-driving grid will be the catalyst for transformation in the electricity industry.

Today, I'm excited to announce the launch of a [new video](#) that showcases the work Microsoft is doing in this space. It shows how autonomous grids can help create a virtuous feedback loop both for utilities and customers as demand is matched with supply, allowing for the consumption of clean and affordable energy.

1:22

Confidential



[Smart Grid: Microsoft and Agder Energi Partner for Grid of the Future](#)



[Microsoft, Agder Energi partner to show how smarter grid can help Norway become more sustainable](#)



Thank You!

ευχαριστώ Salamat Po متشكراً شكراً Grazie

благодаря ありがとうございます Kiitos Teşekkürler 谢谢

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Hvala Köszönöm Tak Dank u Wel ДЯКУЮ Tack

Mulțumesc спасибо Danke Cám ơn Gracias

多謝晒 Ďakujem תודה நன்றி Dėkuji 감사합니다



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