Advanced Manufacturing in Practice

Webinar Series

Achieving efficiencies, improving quality, and accelerating time-to-market through technology.

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April 27, 2022

In This 4-Part Webinar Series You Will Learn

- How **Industry 4.0** is driving advanced manufacturing

- How advanced manufacturing can **improve quality**

- How advanced manufacturing can **increase competitiveness**

- How to get to market **faster**

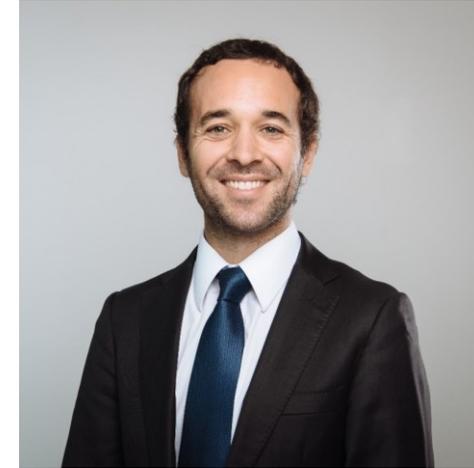flex

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How is Industry 4.0 Driving Advanced Manufacturing?

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Eduardo Toledo

Vice President, Quality &
Operational Excellence

Flex

California, USA.

Felipe Bezamat

Head of Advanced Manufacturing

World Economic Forum

Geneva, Switzerland.

In Today's Webinar We Will Address the Following

- Increase quality standards and meet regulatory requirements

- Meet the demands of increasing supply chain complexities

- Improve material management via robots

- Reduce energy consumption with IIoT

- Utilize advanced analytics to optimize manufacturing performance

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Time to Think Beyond Manufacturing Operations

Advanced Manufacturing and Value Chains

Mega-Trends are Accelerating the Transformation

- Climate change and the imperative of a net zero world

- New customer needs and a constantly changing demand environment

- Digital transformation is here to stay and disruption will further accelerate

Drive efficiency across their operations

Build new capabilities to help build resilience

Develop more innovative, more sustainable and more inclusive approach to value creation

The Advanced Manufacturing and Value Chains Platform

PRIORITIES

Shared value creation

Resilient value chains

Technology adoption

Workforce engagement

Sustainable production

Power of data

COMMUNITY-LED INITIATIVES

Shared value creation	Resilient value chains	Technology adoption	Workforce engagement	Sustainable production	Power of data
New business models enabled by Advanced Manufacturing	Navigating Global Value Chain Disruption	<u>The Global Lighthouse Network</u>	New Generation Industry Leaders	Accelerating Sustainable Production through Digital Traceability	Unlocking Value in Manufacturing through Data Sharing
The Make at Home Initiative	Global Network of Advanced Manufacturing Hubs	Global Smart Industry Readiness Index (SIRI) Initiative	The Augmented Manufacturing Workforce	Net-Zero Manufacturing Value Chains	
	The New Industrial Strategies Agenda	Biotechnologies for the future of manufacturing	CHROs Taskforce	ESG In Advanced Manufacturing	
		Industrializing Additive Manufacturing			
		Advanced Manufacturing Sharing Platform			

The Global Lighthouse Network

90 sites (including 3 Sustainability Lighthouses) where 4IR technology is successfully deployed at scale

Sustainability Lighthouse • Existing Lighthouse
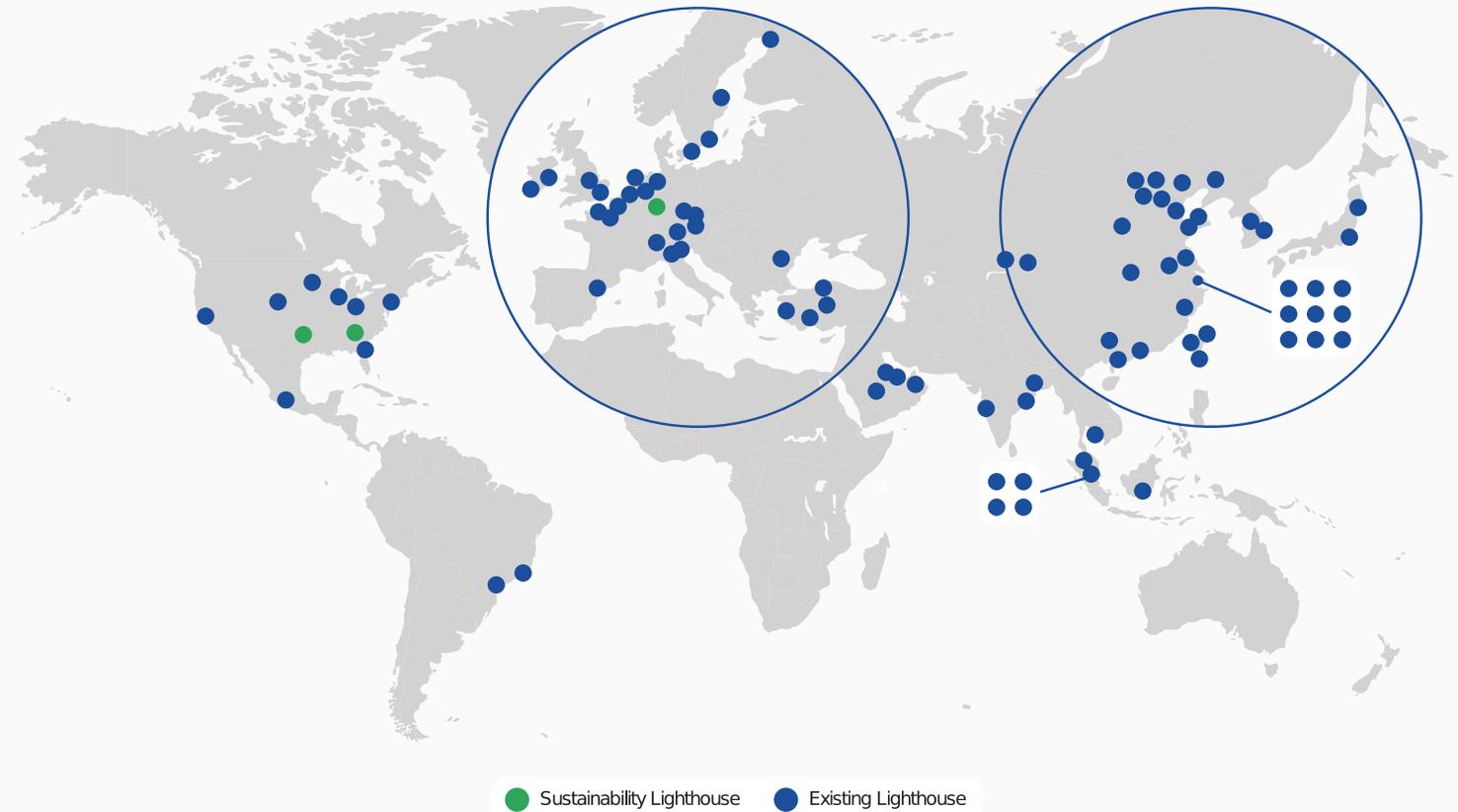
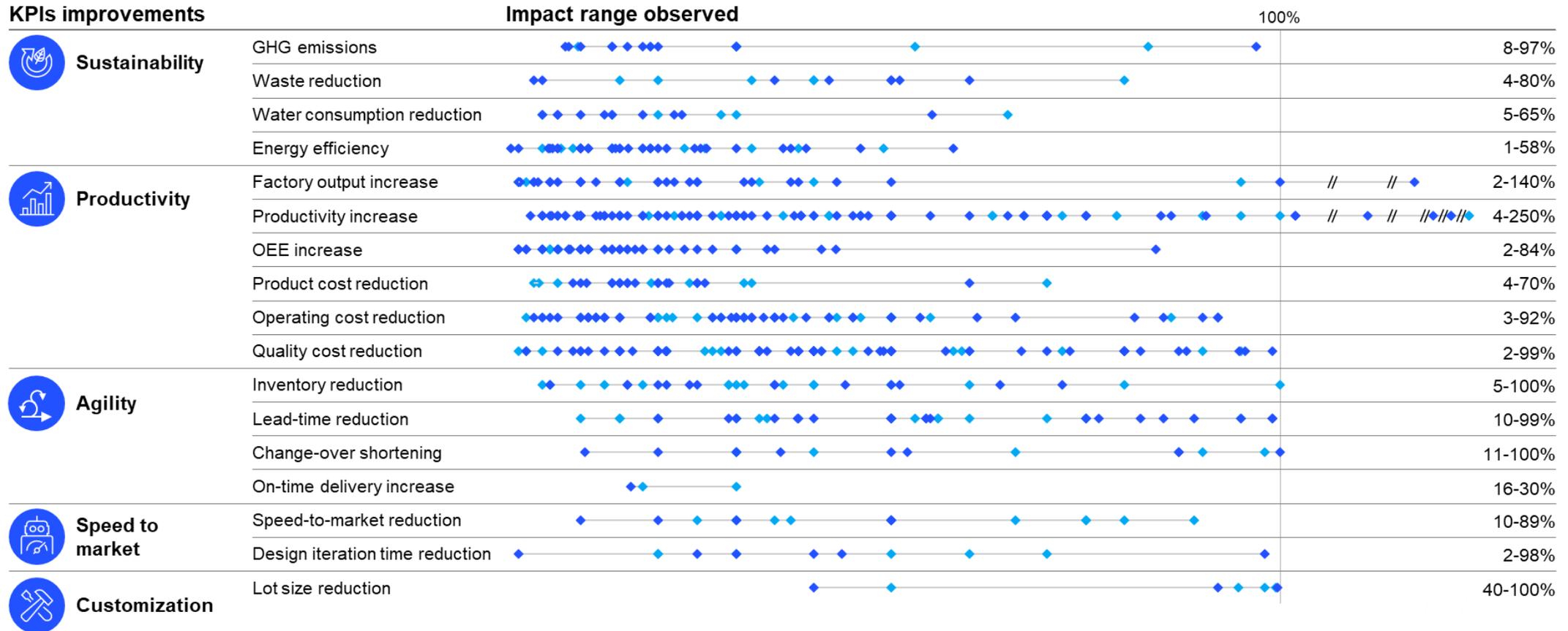**70% of companies** stuck in the "pilot purgatory"

Opportunity: identify leaders in 4IR and accelerate technology adoption through knowledge sharing and inspiring the global community

Global Lighthouse Network: 90 sites from across different geographies and industry sectors

Examples of companies in the network: Alibaba, Bayer, BMW, Bosch, Ericsson, Groupe Renault, GSK, Haier, Henkel, Hitachi, HP inc., Johnson & Johnson, Micron, Nokia, Midea, Procter & Gamble, Schneider Electric, Saudi Aramco, Siemens, Tata Steel, Unilever and Flex.

Lighthouses Are Generating Double-Digit Impact

KPIs improvements — **Impact range observed** — legend: ◆ Factory ◆ End-to-end

Category	KPI	Range
Sustainability	GHG emissions	8-97%
	Waste reduction	4-80%
	Water consumption reduction	5-65%
	Energy efficiency	1-58%
Productivity	Factory output increase	2-140%
	Productivity increase	4-250%
	OEE increase	2-84%
	Product cost reduction	4-70%
	Operating cost reduction	3-92%
	Quality cost reduction	2-99%
Agility	Inventory reduction	5-100%
	Lead-time reduction	10-99%
	Change-over shortening	11-100%
	On-time delivery increase	16-30%
Speed to market	Speed-to-market reduction	10-89%
	Design iteration time reduction	2-98%
Customization	Lot size reduction	40-100%

Four Durable Shifts

- **Agility and customer-centricity** put at the centre of operations leading to faster recognition of customer preferences and corresponding adjustments of manufacturing flows at next-generation, small-scale modular plants

- **Supply chain resilience** as a competitive advantage requiring connected, reconfigurable n-tier supply ecosystems, regionalization and overall higher level of customization

- **Speed and productivity** attained through increased levels of automation and workforce augmentation, increasing safety and competitiveness in a society where continuous reskilling and mobility are becoming the norm

- **Eco-efficiency** is a must-have to stay in business and ensure compliance with an increasingly complex regulatory landscape

I4.0 Driving Advanced Manufacturing: Althofen Case Study

The Challenge: Competition from low-cost regions limited growth prospects at Althofen

The Solution: Deploy Industry 4.0 technology

- Unlock access to longer lifecycle medical class III market
- Keep existing high-mix low-volume business stable within the same physical footprint

Technologies deployed:

- LISA (Line Stop Assistant), a virtual operator assistance system
- Flex Pulse real-time supply chain management system
- Integrated material management and automation
- IT and IIoT integration for energy usage management
- Advanced analytics platform

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Increasing Quality Standards and Meeting Regulatory Requirements
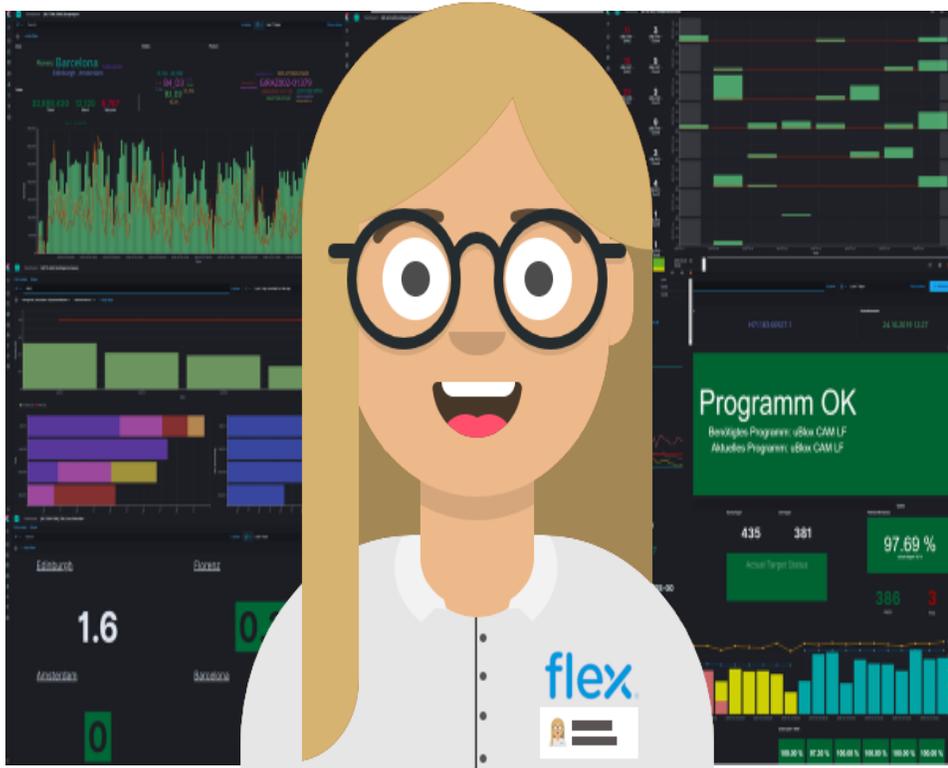
Althofen created LISA (Line Stop Assistant), an automated virtual assistant that stops production lines upon quality issues or setup inconsistencies.

- Serves as an automated poka yoke

- Line errors are detected immediately, and lines are stopped automatically

- Support quick change overs, online qualification checks, and helps remove stress from operators

- Reduced quality related downtime by nearly 60%

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Meeting the Demands of Increasing Supply Chain Complexity

Althofen utilizes Flex Pulse, our cloud-based, intelligent software ecosystem that provides real time, end-to-end supply chain visibility

- Better and faster decision making with single source of truth shared with customers and suppliers through APIs

- Improved inventory management and reduced liabilities

- Managers leverage real time insights from 88 different processes to solve complex issues

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Integrating Robots for Improved Material Management

Althofen's Kanban-based materials management system utilizes smart robotics shelves and autonomous mobile robots (AMR) - all enhanced by in-house software solutions that analyze real-time material consumption and production sequences.

- Supports 900 product changes/month with minimal line-side stock

- Faster replenishment cycles and 72% WIP reduction

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Reducing Energy Consumption via IIoT
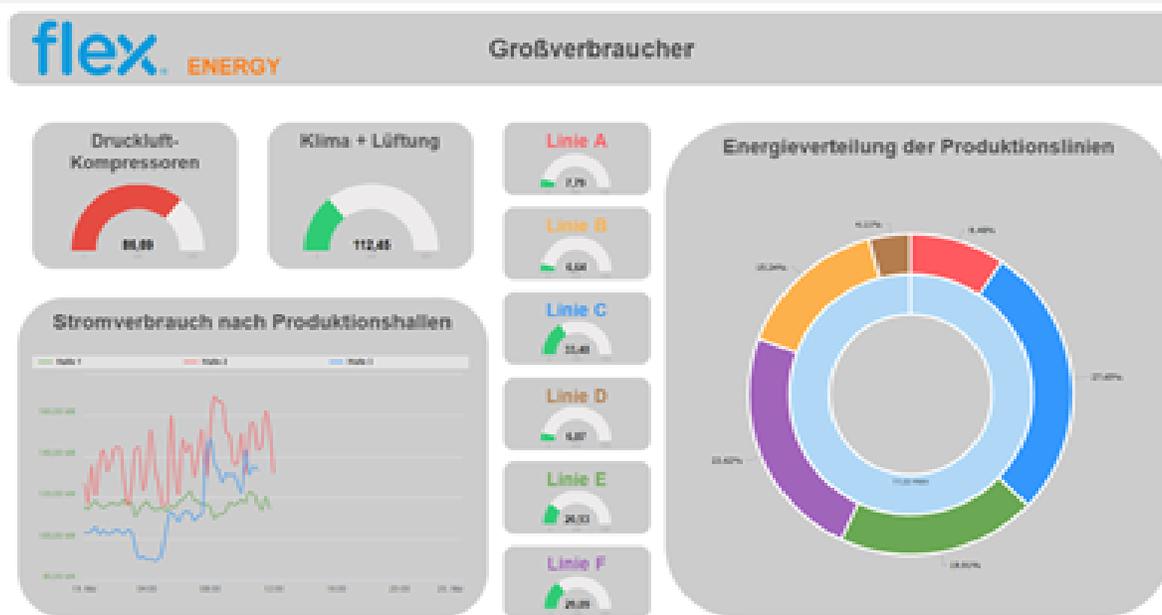
Althofen implemented a highly flexible IIoT-supported energy monitoring system. Data monitoring occurs in real time, triggering alerts on predefined events.

- Fact-based decisions to reduce energy consumption were previously hampered by an inability to analyze energy media flows

- The monitoring and alerting platform resulted in a 23% energy consumption decrease per capita

- This reduction takes plan in an already carbon emission free (scope 1 & 2) site

Utilizing Advanced Analytics to Optimize Manufacturing Performance
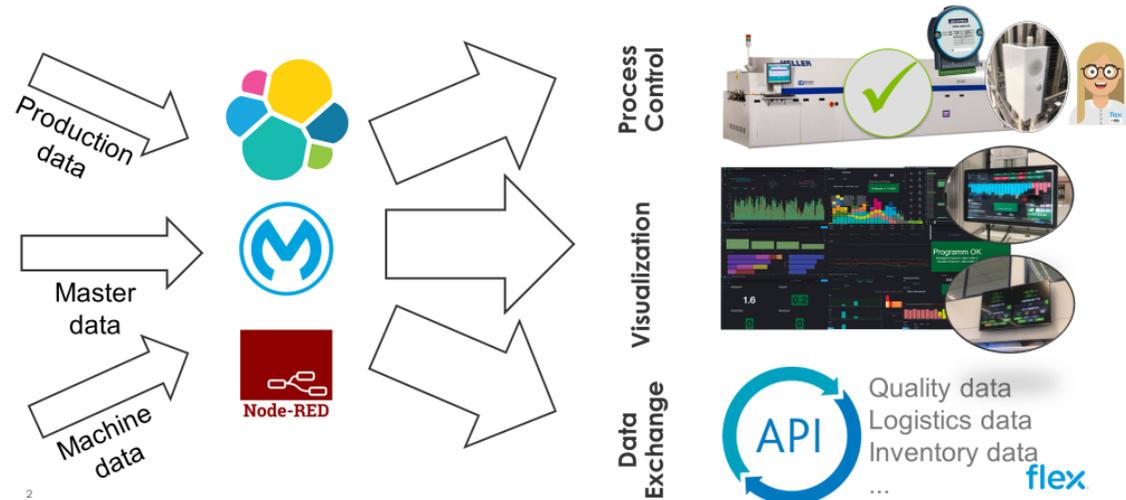
Smart solutions based on innovative software and hardware combinations

Althofen's advanced analytics platform improves upon previous standards to optimize manufacturing with increased efficiency and enhanced overall equipment effectiveness (OEE)

- Advanced analytics and simulation tests revealed suboptimal performance on an SMT line assembler head

- Collaboration with the vendor improved the code, reduced cycle times and increased capacity

- A monitoring system to ensure optimum performance and predictive maintenance was implemented

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Benefits from Our I4.0 Best Practices

- Reduced quality related downtime by nearly 60%

- Managers leveraging real time insights from 88 different processes to solve complex issues

- Supporting 900 product changes/month with minimal line-side stock

- Faster replenishment cycles and 72% WIP reduction

- Monitoring and alerting platform resulted in a 23% energy consumption decrease per capita. This reduction takes plan in an already carbon emission free

- Met higher regulatory and quality standards and attracted longer lifecycle medical business

- Increased revenue by 50% within the same physical footprint

- Admitted into World Economic Forum Global Lighthouse Network

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Thank you!