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USERS CONFERENCE 2016

April 4-8, 2016 | San Francisco

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Leveraging the PI System as the Foundation of Production Systems

Roadmap for Evolution

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Operations Model & Planning Manager

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Company overview

Business

CEMEX is a global building materials company that provides high-quality products and reliable service to customers and communities in more than 50 countries throughout the world.

A global industry leader

- Annual sales of US$14.13 billion
- One of the leading cement manufacturers in the world
- World's leading supplier of ready-mix concrete, and one of the world's largest suppliers of aggregates
- One of the world's top traders of cement and clinker

* Production Capacity ** Annual Production Levels

2015 Annual Report http://www.cemex.com/AboutUs/CompanyProfile.aspx

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CEMEX - Journey through Operational Intelligence

1995 - 2004	2005	2006 - 2008	2009 - 2010	2011 - 2014	2015 +
Initial PI System Implementation • CEMEX installed PI System in 12 plants under component based scheme	**Enterprise Agreement** Access to: • Unlimited tags, visualization & Interfaces • Access to EA Services (CoE, EPM, Field Service)	**Worldwide PIMS Project** • 58 Cement Plants • 12 Grinding Plants • 14 Countries • Executed in 20 months	**PI System Infrastructure as Enterprise Platform** • Energy Mgmt. Pilot • Emissions Pilot • SAP Integration Pilot	**Cement Production Management** • Quality Management • Data Validation Module • High Availability	**CPM 2.0 & Democratization Of Data** • Emissions Management • CBM • Corporate Reports • BI Integration

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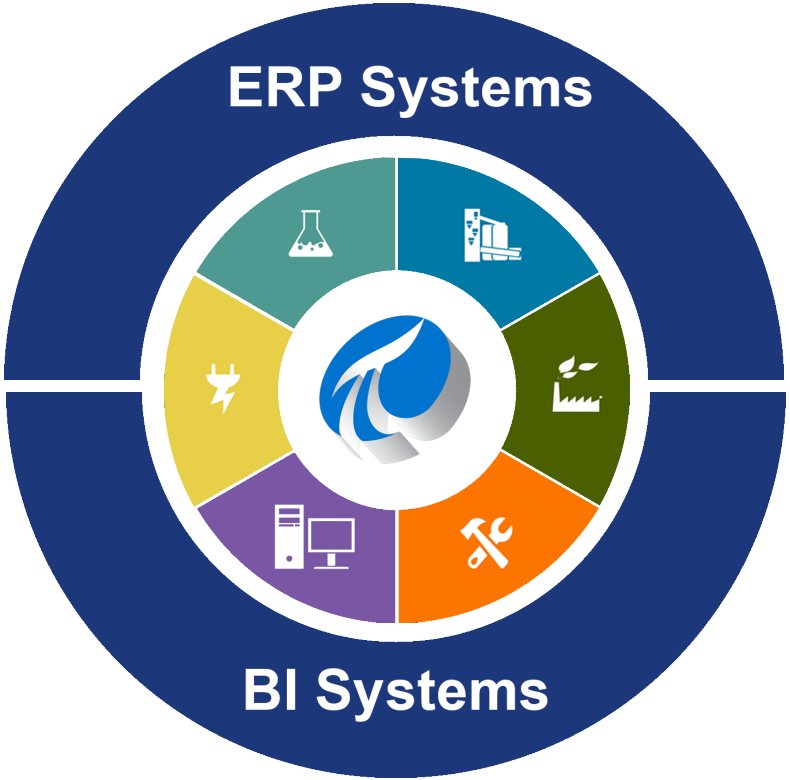
CEMEX - Cement Production Management



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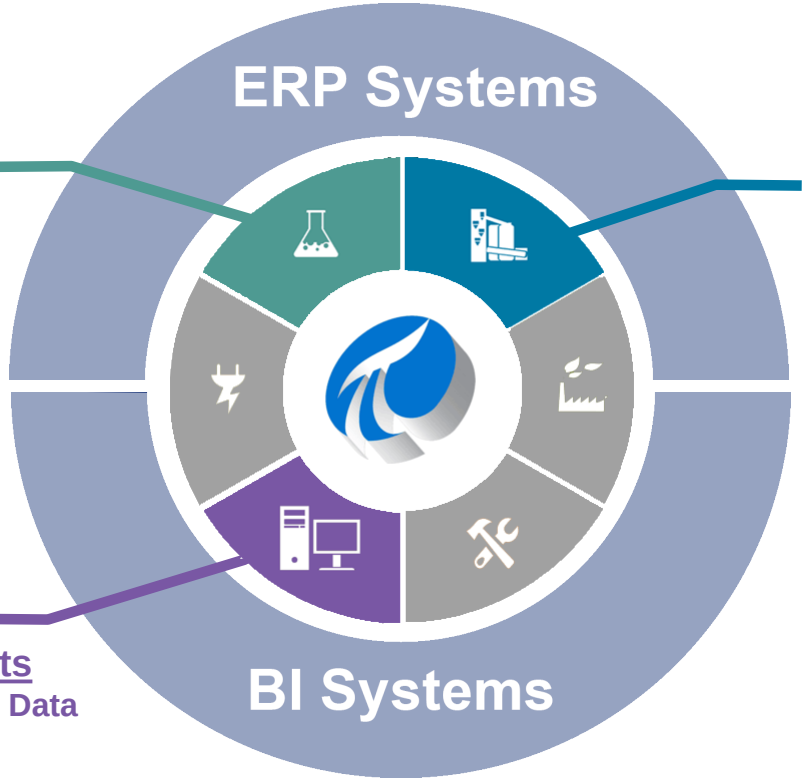
CEMEX - Cement Production Management



Quality Data
- Quality Management

Production Data
- Production Data Validation

Data Visibility, Analysis and Reports
- Democratization of Data

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CPM Initiatives

Use Cases

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CPM - Production Data Validation

Challenges

- Automation of production data validation and reconciliation.
- Provide production managers a set of standard criteria to assess raw data from the plant floor to certify its accuracy.
- Send automatic to SAP system end-user validated data.
- Lower gap differences between raw data and validated data.
- Replace legacy system.

Solutions

- Create a web based application for data validation and integration with SAP.
- Tools used:
  - **PI Data Archive**
  - **PI Asset Framework**
  - **PI SDK / AF SDK**
- No tag license limitation.
- Use of CoE recommendations on the use of AF.

Benefits

- Single point for data entry.
- Simple way to control operational data.
- Ensure data accuracy and reliability.
- Standardize criteria to report production results.
- Minimize time to process data and avoid reprocessing.
- Maintain references for future operations audits.

Inventory Adjustments reduction (2011-2014):
95 % Clinker
47 % Cement

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CPM - Quality Management

Challenges

- Correlate quality and operations data.
- Reduce data consolidation times.
- Deploy a flexible solution to read data from different lab equipment vendors.
- Share real time quality data with other users.
- Standardize and simplify access to data.
- Difficult to consolidate global information.

Solutions

- Replace existing Legacy system leveraging existing PI System infrastructure at each plant .
- Tools used:
  - **PI Data Archive**
  - **PI Datalink / MS Excel**
  - **PI UFL for X-Ray analyzers**
- No tag license limitation
- No extra user licenses required

Benefits

- Single point for data entry.
- Quality and Production data correlation.
- Data Standardization.
- Real-time Quality KPI's
- Faster data gathering process
- Enhanced data security
- Cross business visibility.

Reduction of Total Cost of Ownership (TCO)

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CPM – Democratization of Data

Challenges

- Enable the Business Intelligence platform to access the operation data.
- Reduce data extraction and preparation time, since it was taking approximately 1 month effort.
- Provide context to the data: *Information into insights*
- Make data accessible to other areas of the company - *Democratization of Data* to have continuous improvements.

Solutions

- Configured extraction views from PI System which deliver data to Business Analysis tools, such as Tableau.
- Tools used:
  - **PI Asset Framework**
  - **PI Integrator for BA**
- Use of CoE recommendations
- Configured a Cement Operations Data Model in AF.

Benefits

- Extraction time reduction.
- No development cost since PI Integrator for BA is intuitive and self configuring.
- Simple way to analyze operational data.
- Opened new conversations across the company.
- More time spent on value added activities.

Data extraction time reduced from 1 month to 5 minutes.

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CPM 2.0
Evolution Strategy

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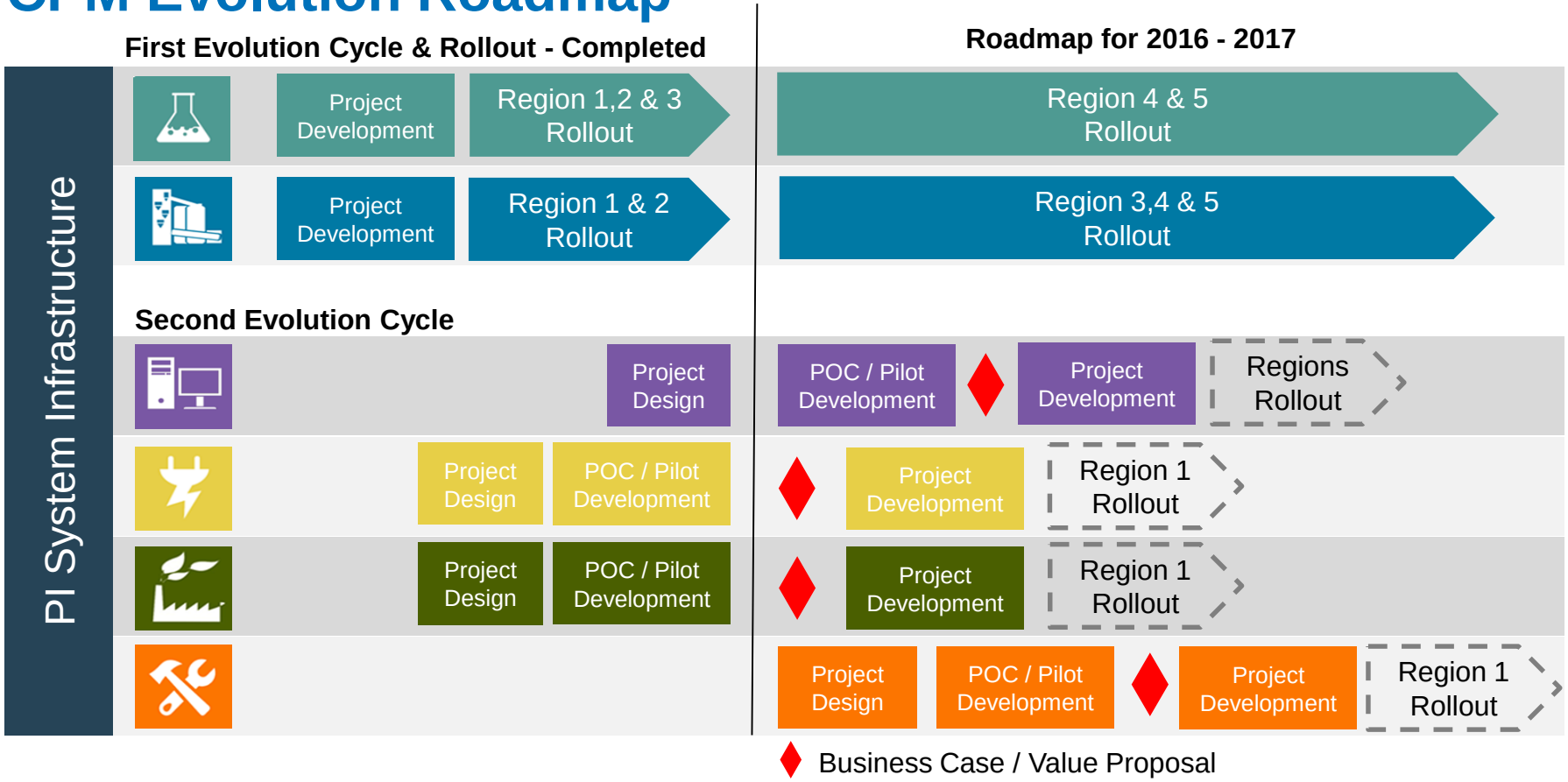
CPM Evolution Roadmap



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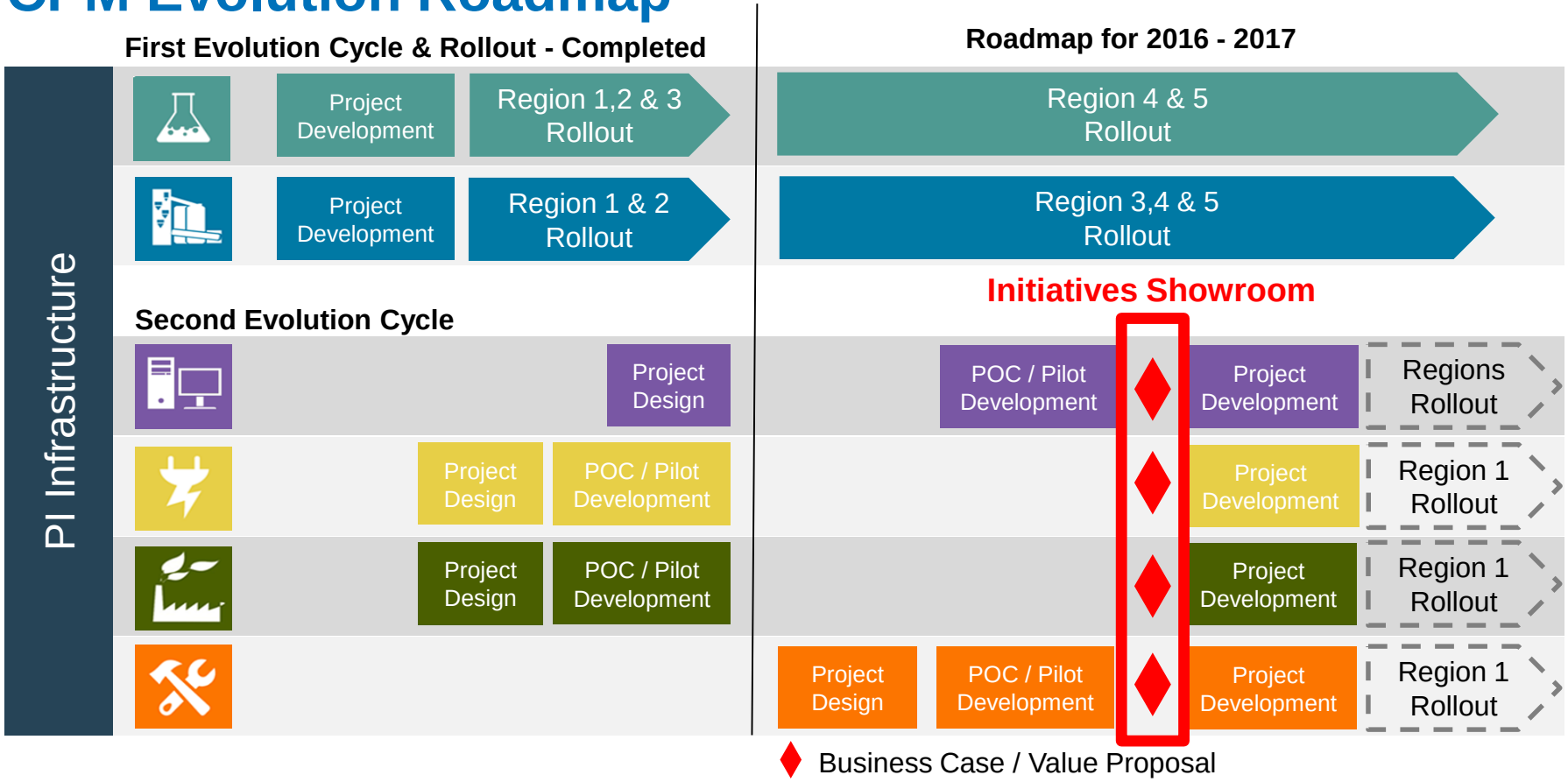
CPM Evolution Roadmap



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CPM Future Initiatives & Defining a Business Case

Initiative	Objective
Global Quality KPI	Consolidate and compare in a single platform quality and production data.
Corporate Control Center	Replicate all plants' Control Center panels to enable a centralized monitoring and support team.
Cement Operation Management Platform	Standard all plant dashboard platform for operation management.
Downtime Analysis	Record, alarm and analyze all downtimes to minimize operation impacts and prevent future downtimes.
Vibration Analysis	Incorporate the analysis being performed manually into PI System.

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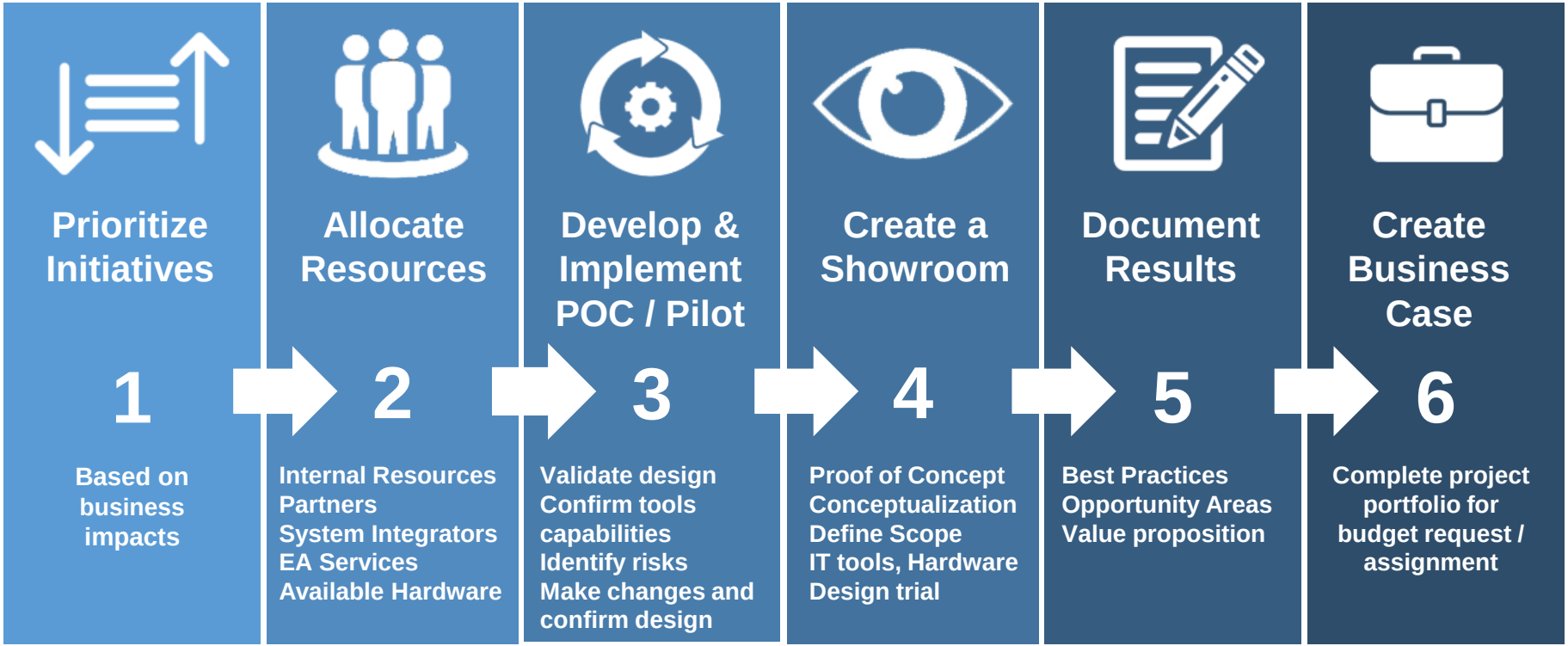
Building the Business Case



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Lessons learned:

- Capture needs and proposals from the operations' network to build the initiative list of projects.
- Check all initiatives correspond to a defined company model.
- Map all initiatives to company objectives and business impacts.
- Testing is never a waste of time.
- Build a showroom, with the least possible use of resources.
- Document value obtained in each initiative.
- This is always an ongoing cycle. Keep moving forward

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谢谢

Danke

Gracias

Merci

Thank You

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Спасибо

Obrigado

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