

# Industrial Strategy to identify priorities in energy mix policies in Africa as a result of joint discussions about local needs and resources

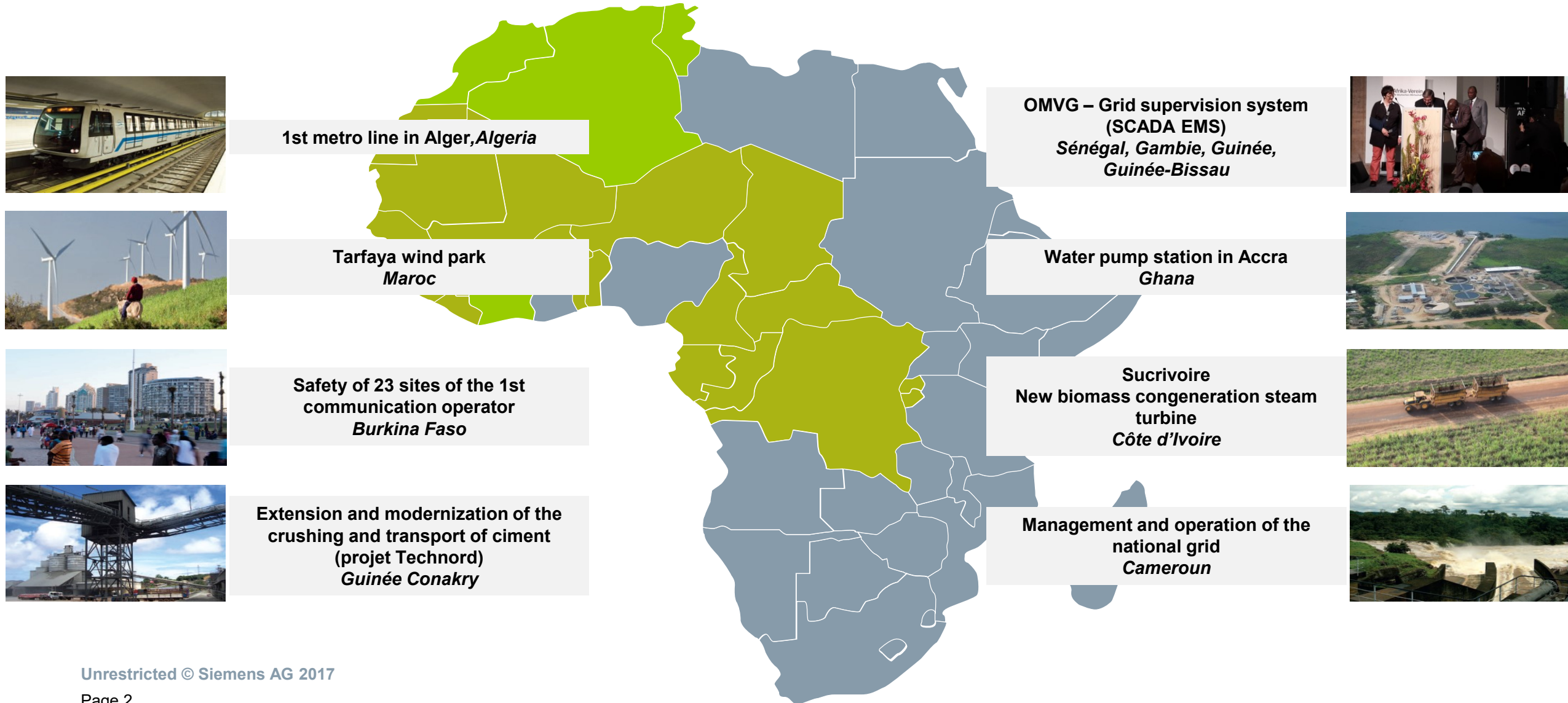
François-Xavier Dubois

Head of Power Generation Projects West & Central Africa

Brussels | October 23<sup>rd</sup> , 2017

# A passion for Africa since 1976

**SIEMENS**  
*Ingenuity for life*





## Top priorities in the African Region



Strengthening  
the Economy



Developing  
jobs and skills

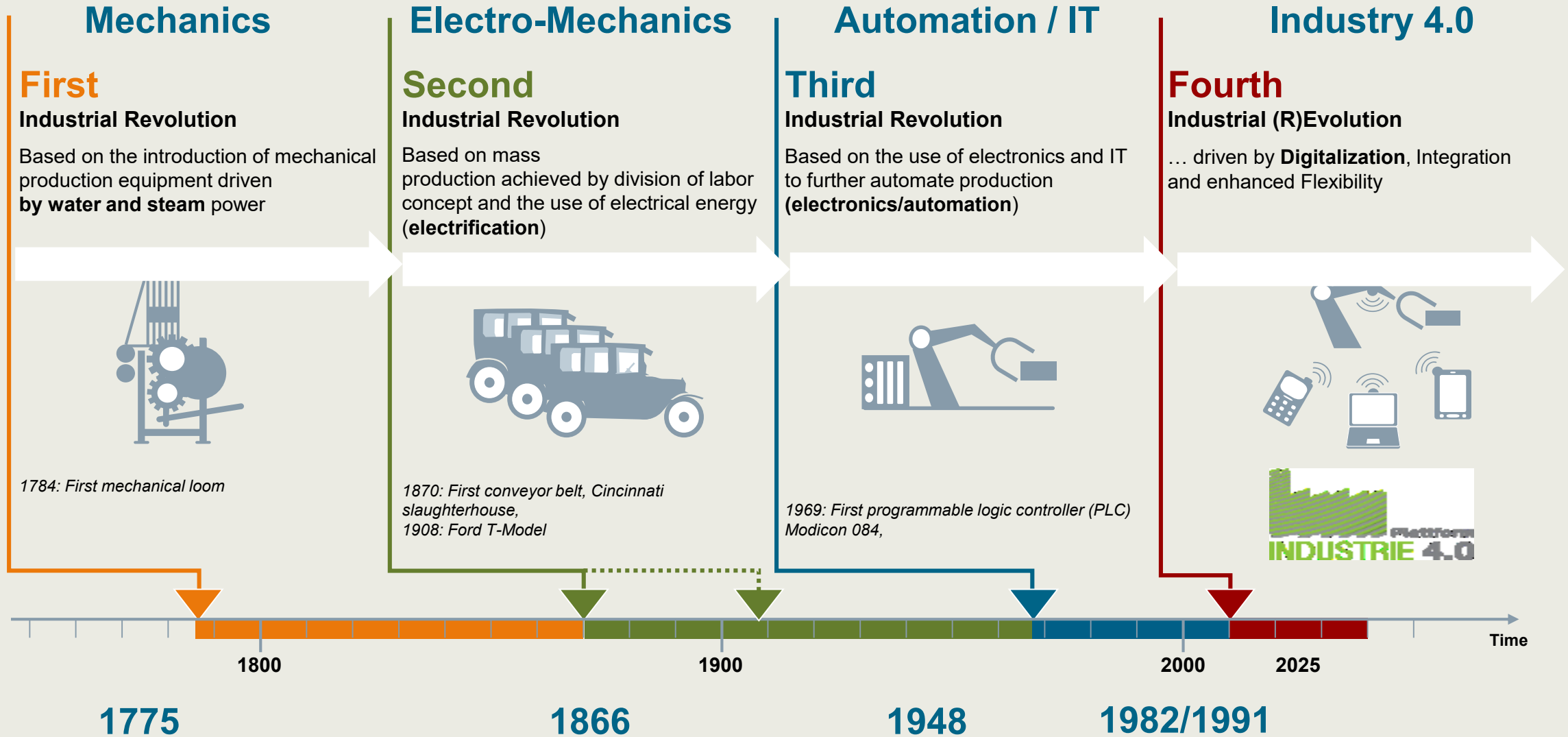


Improving  
Quality of Life



Sustaining the  
Environment

# The evolution towards Industrie 4.0



# Siemens brings solutions to Industry's challenges of tomorrow: Electrification – Automatization – Digitalization



## Digitalization



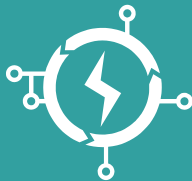
- Added value for our customers are more and more through softwares and advanced digital platforms
- Innovation through data management is becoming one of the focusses of Industry
- We want to be part of tomorrow's digital world

## Automatization



- Siemens is already wordl leader in automatization
- We have been successful for years in automizing our customers processes
- Our intention is to grow and maintain this position

## Electrification



- Siemens roots are in electrification – we are leader in that domain
- Siemens covers the whole electrification chain: from the fuels extraction and handling to the production and transport of the electricity to the customers.
- We capitalize on our large installed base and create added value for our customers through innovation and optimized services

Digital  
expertise



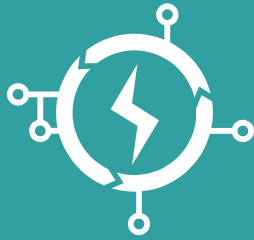
Specific  
know-how





# Electricity chan

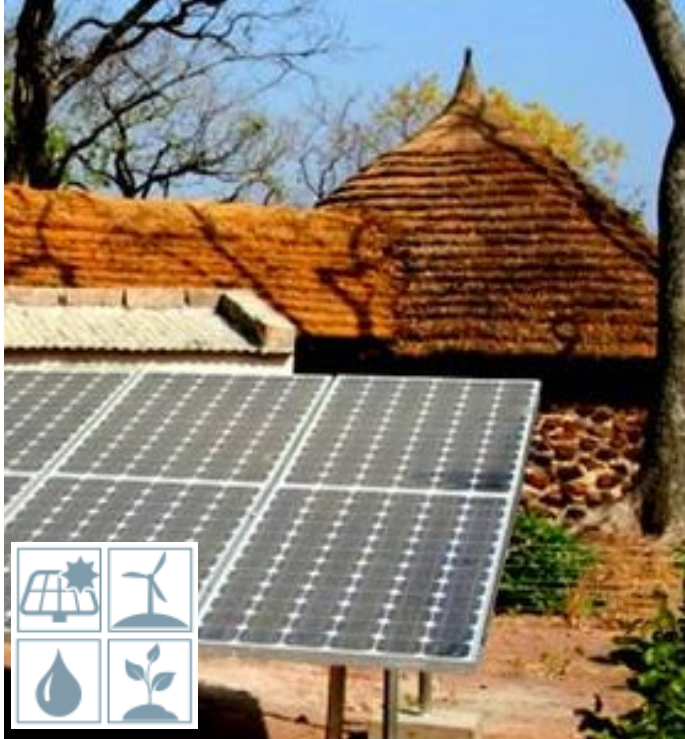
## Electrification



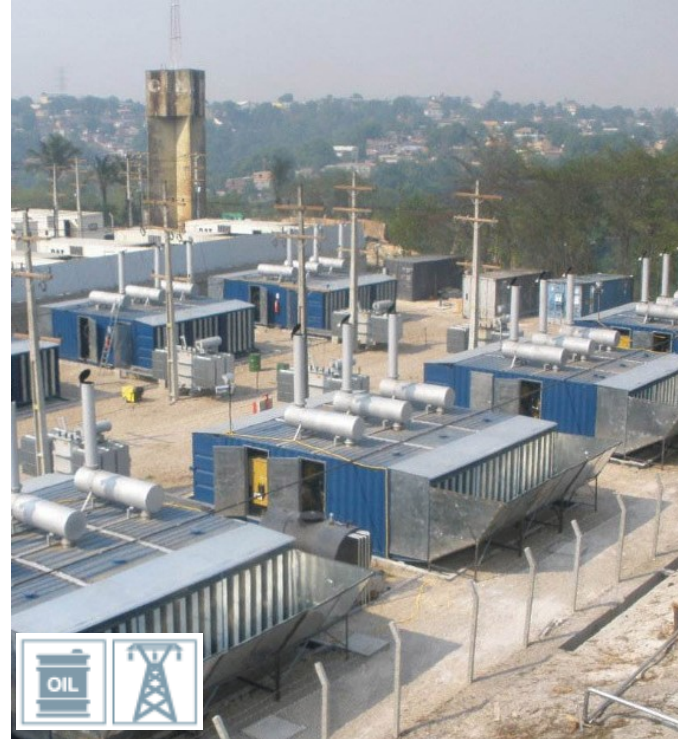


# Electrification vision for the African Region

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**Long term vision:**  
renewable energy mix  
for Africa



**Today's challenge:**  
leave heavy fuels and  
increase rural  
electrification

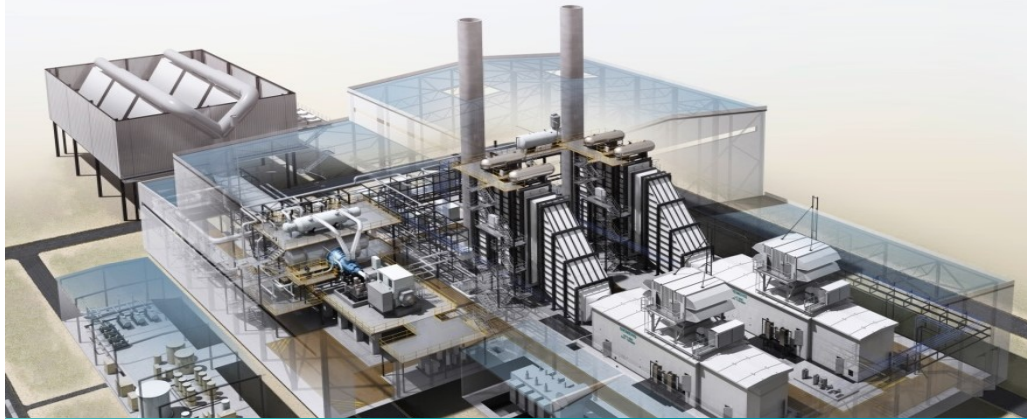


**Solution:**  
sustainable energy  
transition



# Energy transition & Industrialization through flexible, reliable and sustainable electricity - Fossil Contribution

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**Industrial Combined Cycles**



**Sustainable biomass**



**Cogeneration**

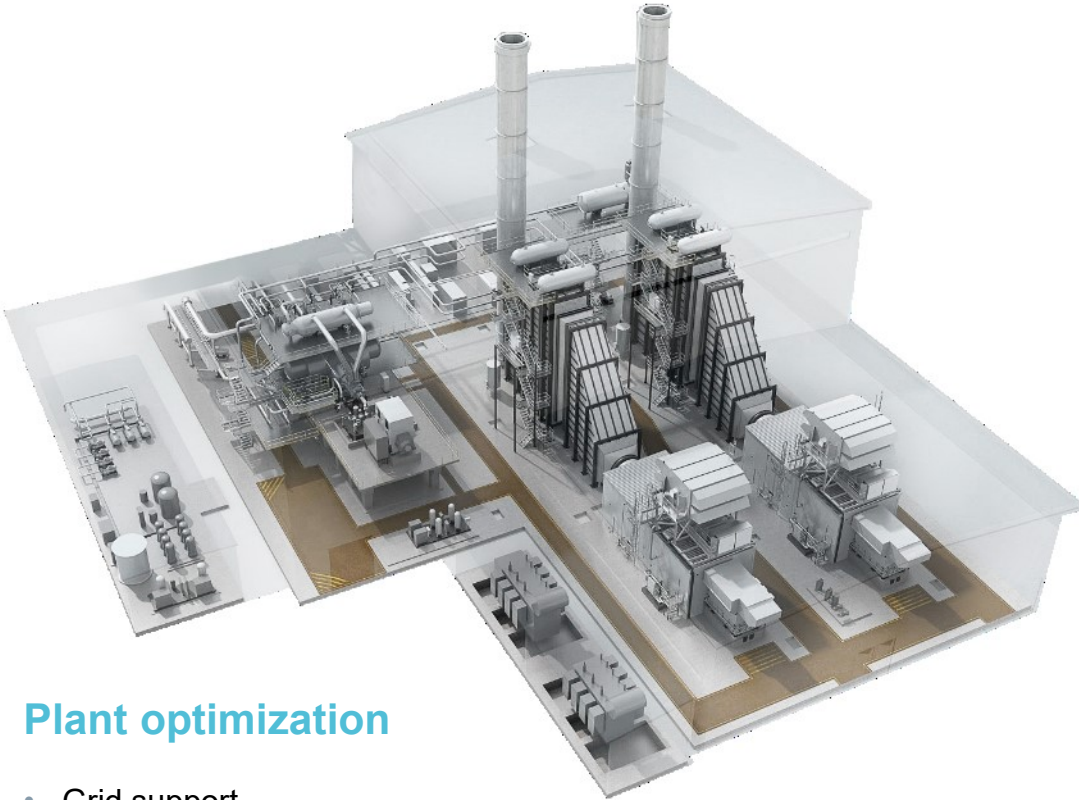


**Fast power (SGT-A45)**



# 'Small Scale Combined Cycle' with highest efficiency for power generation and industrial development (>30MW)

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## Plant optimization

- Grid support
- Island mode operation
- Multiple power blocks
- Phased construction

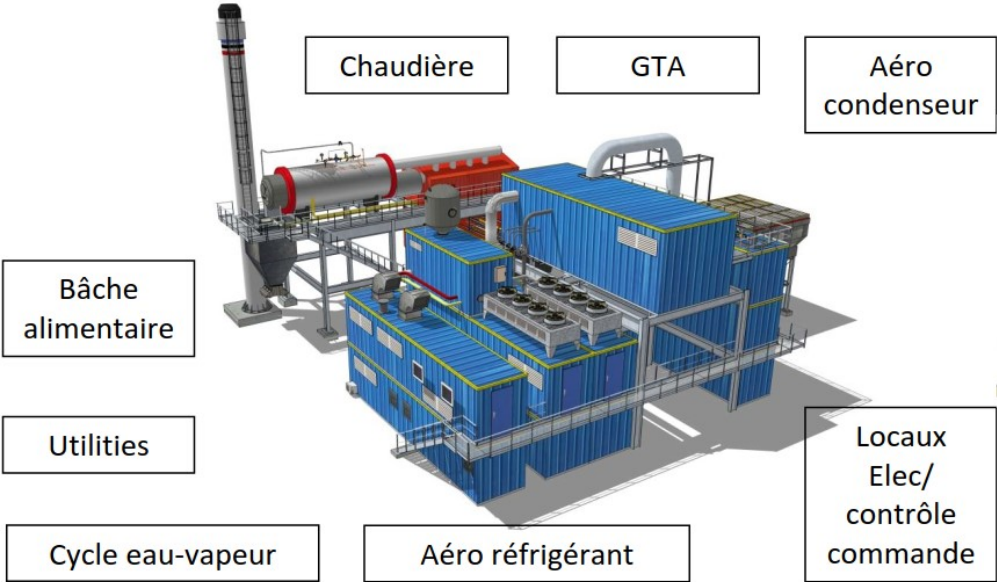
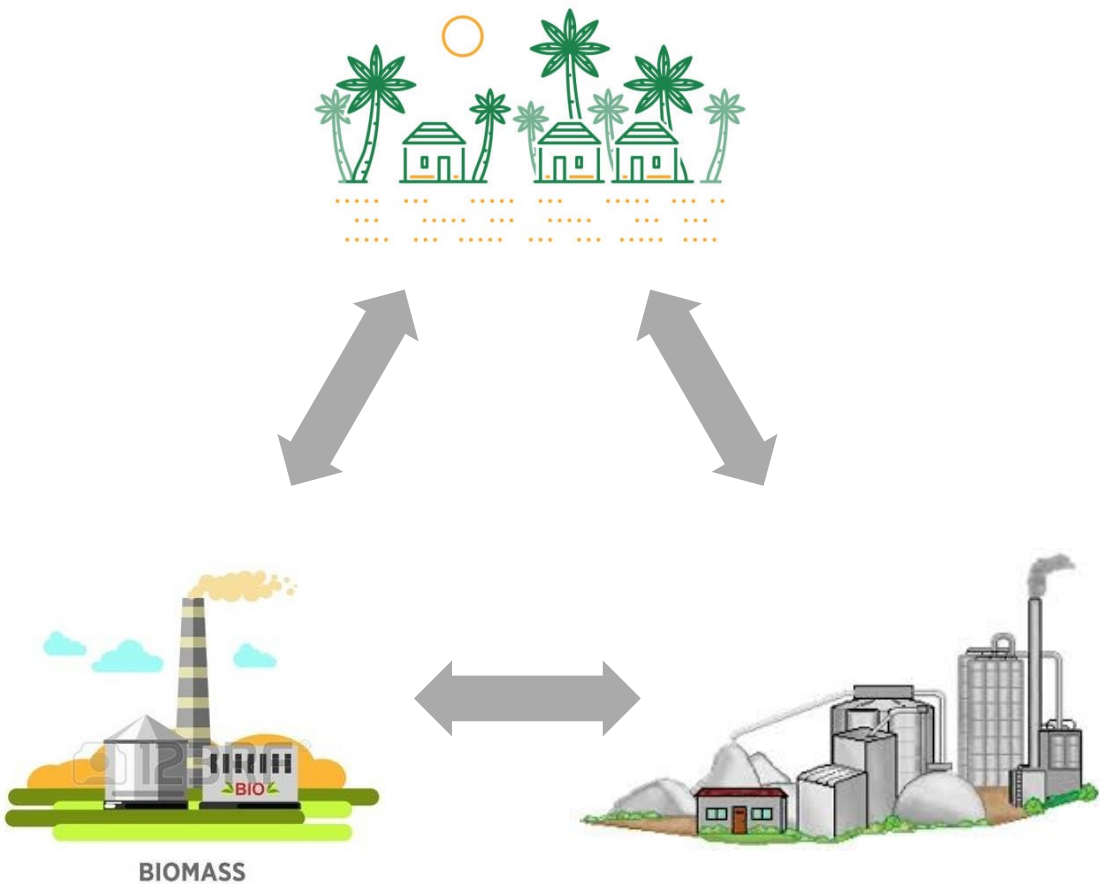
## Industrial power plants for a sustainable energy mix:

- Lowest emissions of fossil fuel generation solutions
- Reliability & availability (~99,5% & >97%)
- Efficient power generation up to. 58.5% CC net

Efficiency (%)	25	30	35	40	45	50	55	60	65
GT Open Cycle									
Gensets									
GT Combined Cycle									

- High exhaust gas temperature for excellent steam-raising capability. >90% CHP efficiency
- EconoFlex™:
  - Flexible combined cycle power plant
  - Perfectly suited as back-up to renewable power sources in the grid
  - 10-minute start, frequent starts and stops, fast load-following
- Fast: Open Cycle electrical production after 8 months

# Industrial & rural electrification through biomass power for central, decentralized and even off-grid power generation





# SGT-A45 TR Mobile Unit

Fast Power. Superior Performance. Trusted technology.

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## Fast Power

- ✓ 2-weeks installation (3 months from NTP to power)
- ✓ Mobile by road, air or sea
- ✓ Minimal site interfaces and preparation

## Cost-effective power solution

- ✓ 44 MW<sub>e</sub> (ISO) with outstanding power density
- ✓ CAPEX savings with fewer units (\$/kW)
- ✓ Performance optimized for hot climates

## Superior value in operation

- ✓ OPEX savings with high fuel efficiency
- ✓ Liquid and gas fuel with same service interval
- ✓ Proven turbomachinery in industrial package

## Flexible, dependable technology

- ✓ 50 Hz or 60 Hz
- ✓ Emissions as low as 25 vppm NO<sub>x</sub>
- ✓ Fast start (< 8 mins) and no “hot lock-out”

# Off-grid Hybrid Power Plants

## The Solution to Maximize Renewable Energy

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# Digitalization changes everything

## Digitalization



# Digitalization Changes Everything, Everywhere

The pace of technological advances is fueling digital transformation

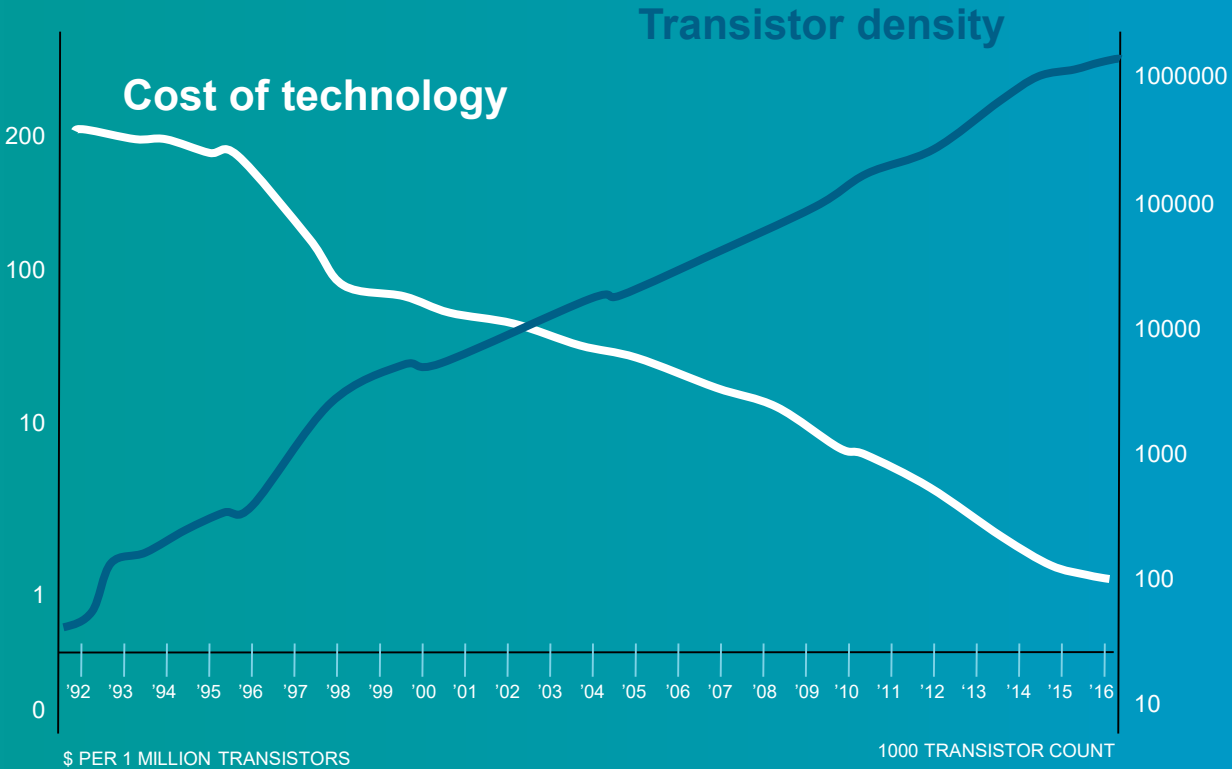


## The cost of key technologies is falling

	DRONES	2007	\$100,000	COST PER UNIT
		2013	\$700	
	3D PRINTING	2007	\$40,000	
		2014	\$100	
	INDUSTRIAL ROBOTS	2007	\$550,000	
		2014	\$20,000	
	SENSORS	2007	\$30,000	
		2014	\$80	
	SMART PHONES	2007	\$449	
		2015	\$10	

Source: Accenture Technology Vision 2015

## Implications of Moore's Law

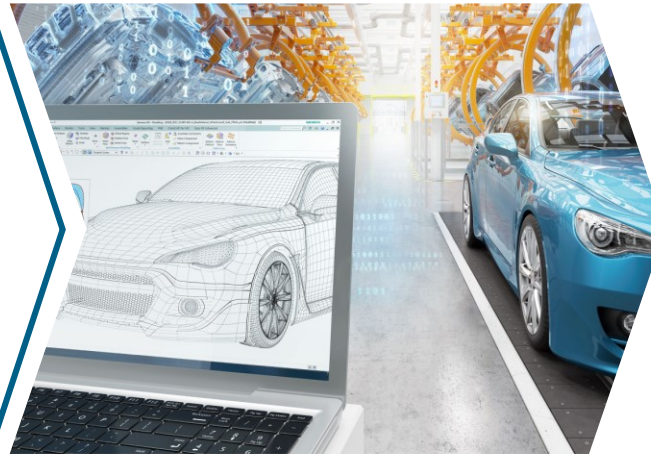
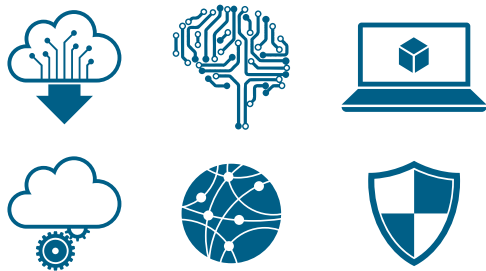


Source: Leading Technology Research Vendor



# Siemens addressing these challenges using digital technologies – Building on Electrification – Automation – Digitalization

## Digitalization



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**Siemens Digital Services**

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**Siemens Software**

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**MindSphere<sup>1)</sup>**

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## Automation



## Electrification



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**Digitally enhanced  
Electrification  
and Automation**

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1) MindSphere – The cloud-based, open IoT operating system

# MindSphere – the cloud-based, open operating system for the Internet of Things from Siemens



## MindApps

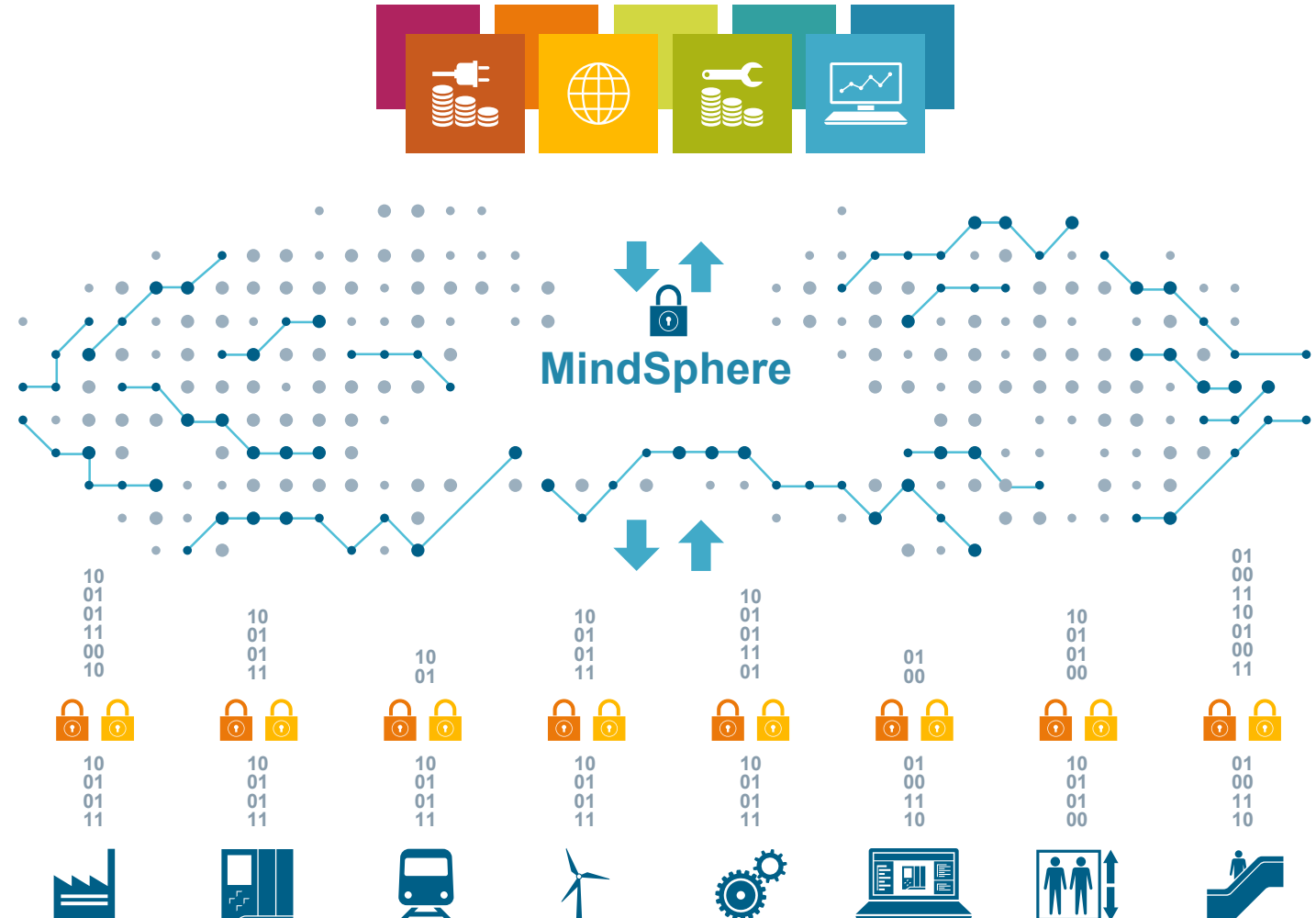
Asset transparency and analytical insights into machines, plants, fleets and systems

## MindSphere

Various cloud infrastructures: Public, private or on-premise

## MindConnect

Secure plug-and-play connection of Siemens and third-party products





# Essential market requirements – Throughout all industries

Security



Speed



Flexibility



Quality



Efficiency





# MindSphere

The Industrial Internet of Things

**It's not about technology,  
It's about a Mindset !**



## Industrialization & Energy Transition for Africa

### Wrap-up



- **Gaz availability** is expected to increase in the future
- **Energy transition** through small size combined cycle with highest efficiency to support industrial development
- Decentral and even off-grid **biomass** as part of the energy mix
- **Digitalization** creates opportunities for industrial development, off-grid power generation and **Hybrid Mix**

## Our Mission

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Develop Siemens in Africa,  
for Africa and with Africa!

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