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and Energy

Shaping the Digital Transformation - Germany's Experiences with Technological and Societal Challenges

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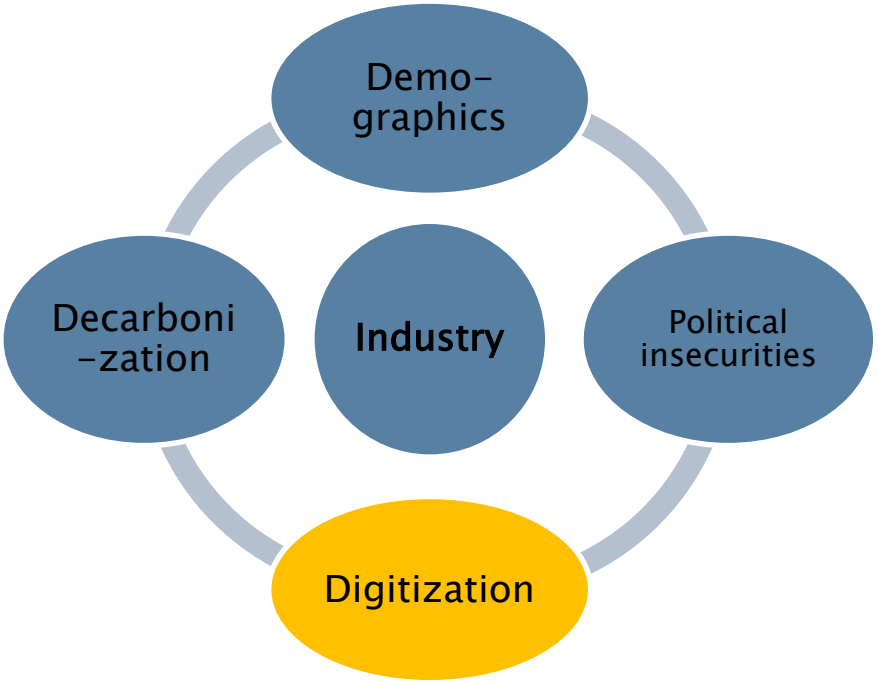
International Conference of Inclusive Korea 2018 on May 25th, 2018, Seoul

Modern Industrial Policy

Turning Challenges into Opportunities



German Industrial Policy

Digitizing the Manufacturing Sector

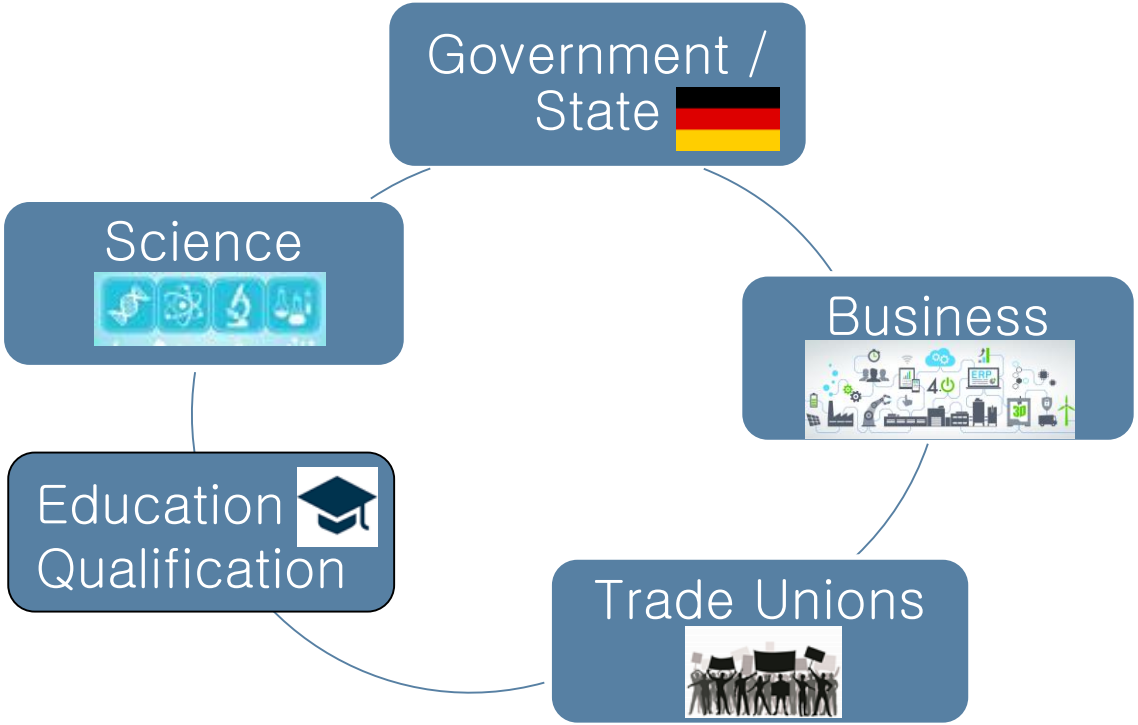
- Industry is a key component for our economic ecosystem
- The industrial share in German GDP is more than 22%
- Germany is the factory supplier of the world
- Our aim: Manufacturing sector in Germany shall become

  - Leading Market for Industrie 4.0 applications and

  - Leading Provider of Industrie 4.0 solutions

German Paradigm

Social Partnership and Strong Networks



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Germany‘s Key Success Factors for Digital Transformation of Manufacturing Sector

- **Involvemt** of all relevant actors:
  - Government and State
  - Business
  - Trade Unions
  - Education / Qualification
  - Science
- **Transparency** throughout transformation process and **sharing of best-practices**
- **SMEs support** with focus on challenges and opportunities
- **Politics as moderator** and provider of suitable regualtory framework

→ **Social partnership and Transfer-Network Industrie 4.0 as key enabler for Industrie 4.0 in Germany.**

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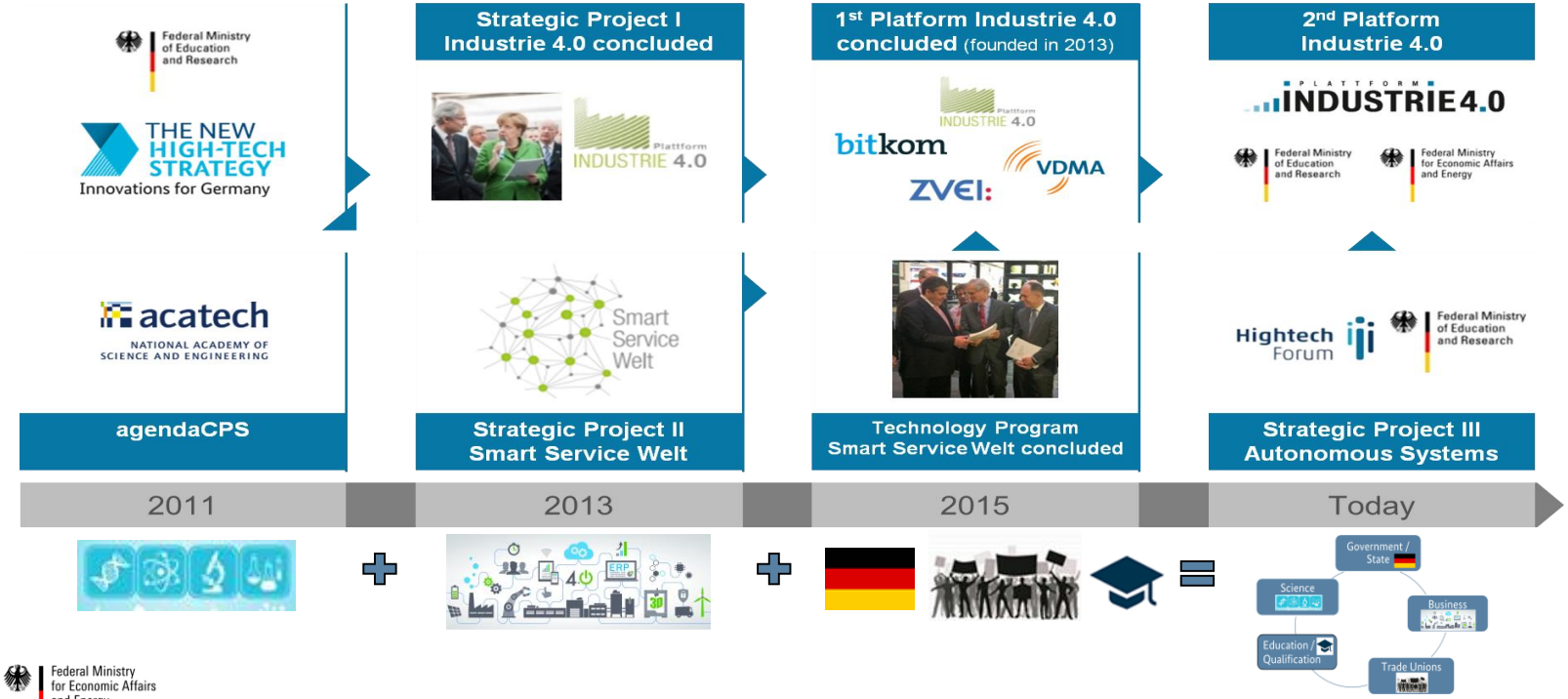
Digital Transformation

Germany‘s Digital Journey



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Transfer Network Industrie 4.0

Network of German Industrie 4.0 Initiatives

Plattform Industrie 4.0
national

Chambers of Commerce & Associations
regional & national

Mittelstand 4.0 (SME 4.0) Competence Centres
(supra-)regional

Initiatives of the States
Nationwide

Test Centres
regional

Projects & Cluster
local or issue-specific

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The Vision for the 4th Industrial Revolution

Benefits for Enterprises and Society

Economic

- Individual products under the conditions of mass production
- Increased productivity and flexibility: minimize time to market
- Value generating processes are optimized to customer demand in real-time
- Growth potential up to 78 billion Euro until 2025.

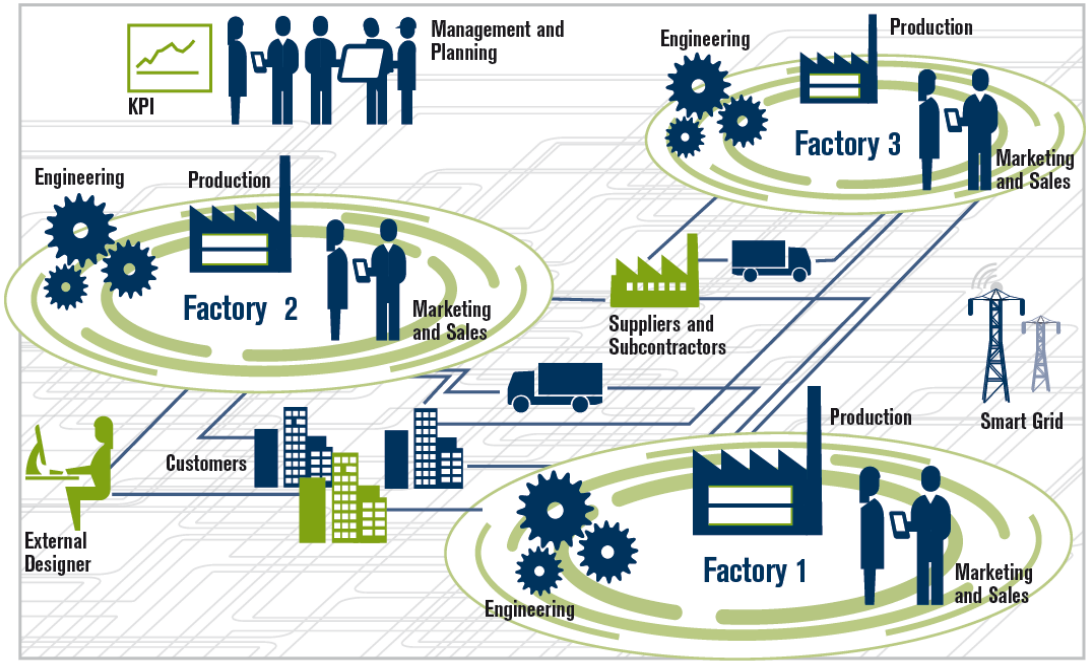
Environmental

- Energy- and resource-efficiency (up to -50%)
- Increased Sustainability (Circular Economy)
- Compatible with urban life = clean production comes back to the city centers

Social

- Smart assistance systems support employees
- “Better Work”: Work-life-balance and appeal of work
- Autonomy for social inclusion

Rethink Value Chains



Ad hoc value networks

- Dynamic reconfiguration in real time
- Trusted data supply chain
- Integration of shop floor and office floor

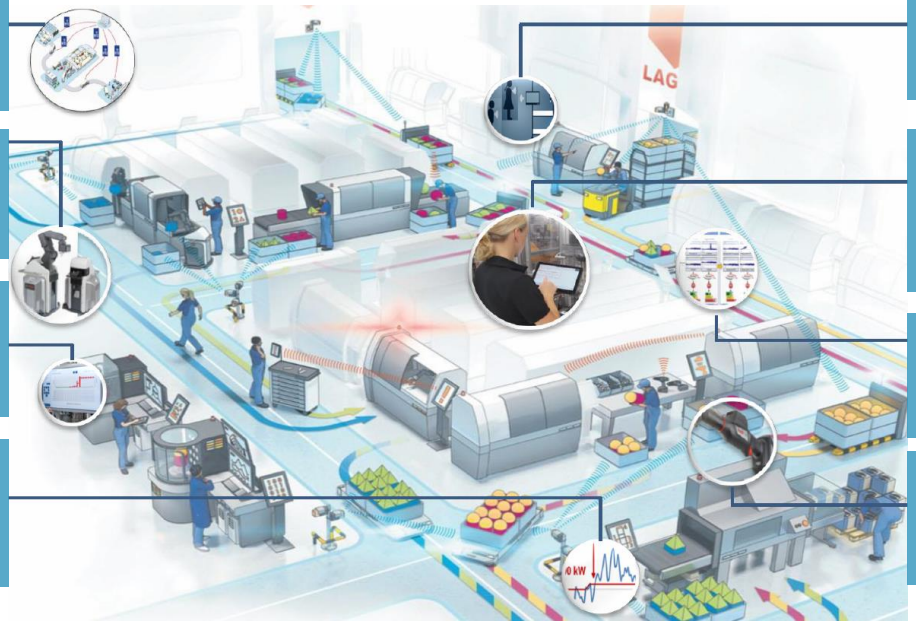
Rethink Production Processes

Digital Value Stream
Significant stock saving

Robotics
Human relief of heavy load

Active Cockpit
Real time data

Energy Management
Energy cost saving



Operator Support
Agility

Predictive Maintenance
No sudden breakdown

Adaptive Testing
Increase efficiency

Smart Product
Quality tracking

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Future of Work

Challenges and Skill Requirements

Increasing automation of routine jobs

New skills and competences:

- Less processing steps that are pre-described, increased importance of self-initiated work
- Less „machine controller“, increase importance of experience and decision making
- New kind of qualification and training: on the job, modular, life-long

Intelligent assistants allow complex tasks despite low skills.

Best-Practice Digital Transformation @ Phoenix Contact

Intelligent Production - Trainee Programm - Testbeds and Smart Factories

Intelligent communication structures: Operators are supported and guided by a wizard. Solution scenarios are visualized.

Joint training program with: electrical engineering, business and information science and mechatronics engineering. Self-built kicker illustrates Cloud-to-Cloud communication for predictive maintenance.

SmartFactoryOWL is an open research and demonstration platform for digital transformation. As an "Industrial IoT Experience Center (IIoT)", new technologies can be tested.

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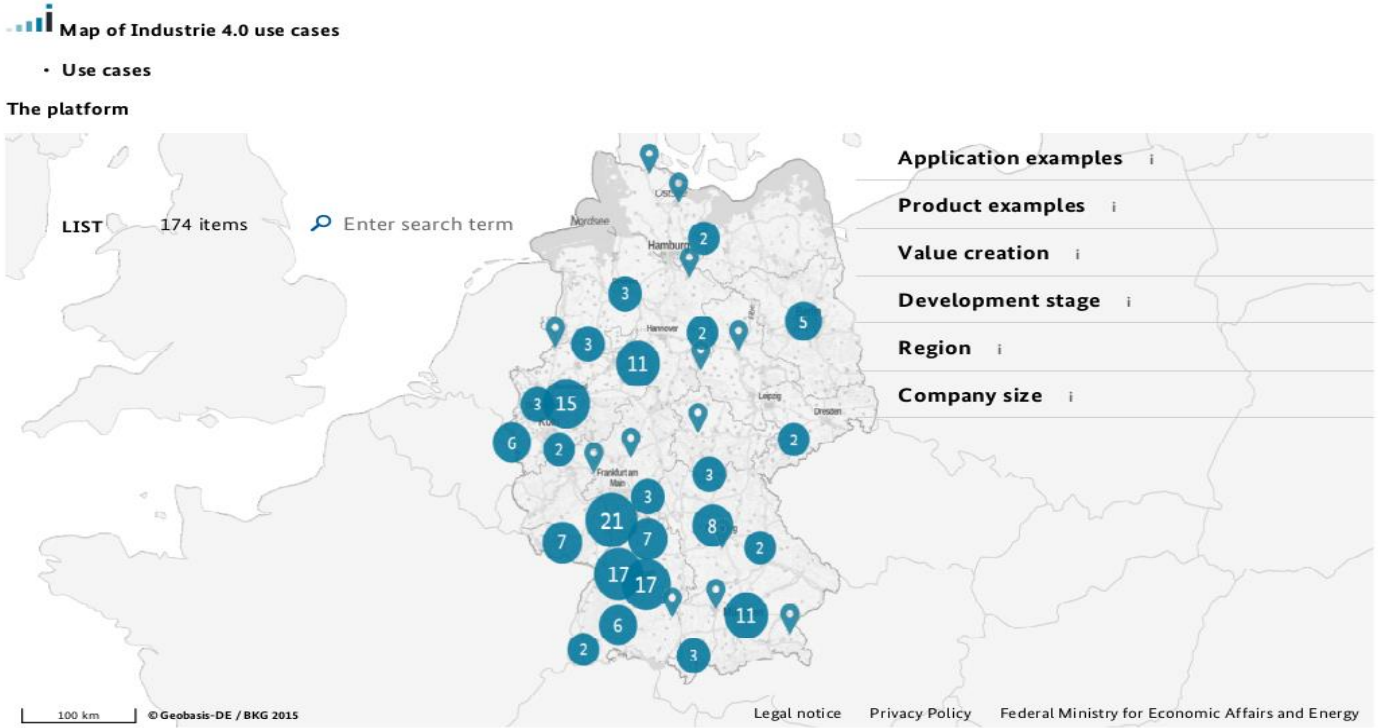
Map of Industrie 4.0 Examples in Germany



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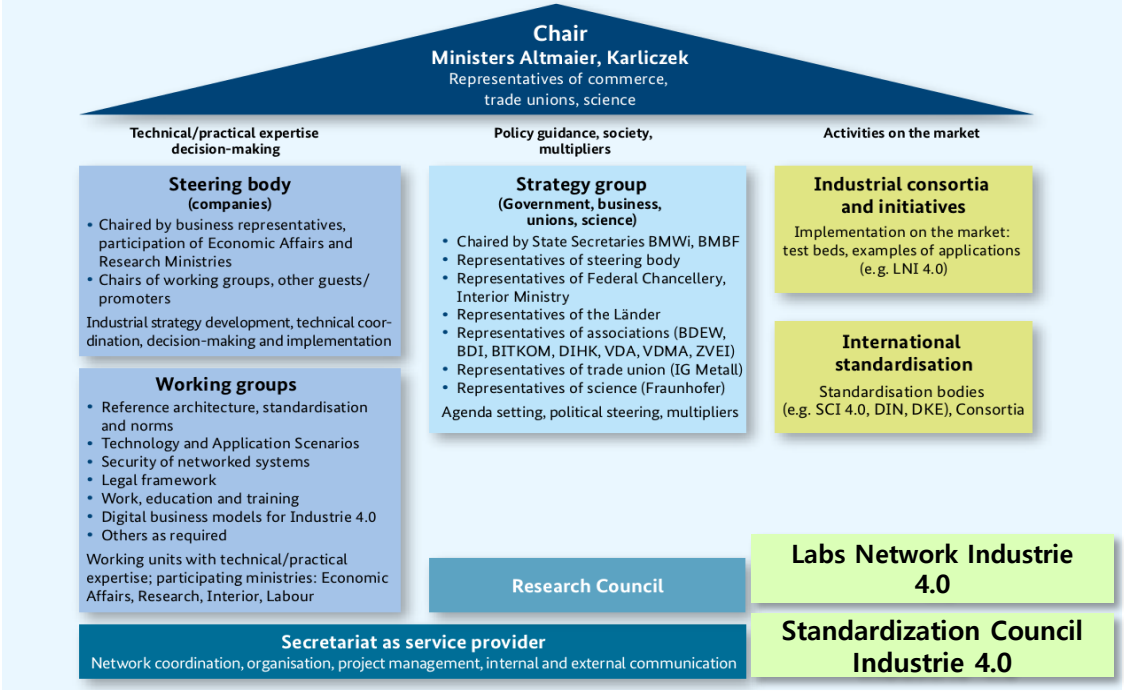
Structure

PLATTFORM INDUSTRIE 4.0



→ One of the world largest Industrie 4.0-networks with over 300 stakeholders from over 150 organizations.

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The Plattform Industrie 4.0

Task and Goals

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The Working Groups

Heart of the Plattform Industrie 4.0

Five thematic priorities

Reference Architectures, standards and norms	Research and Innovation	Security of Networked Systems
Legal Framework	Work, Education and Training	Digital Business Models for Industrie 4.0

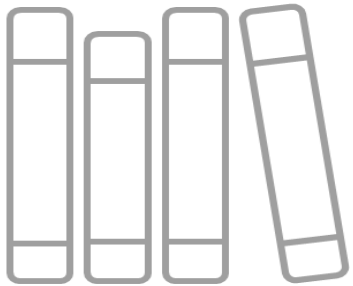
The Platform Offers Information and Support

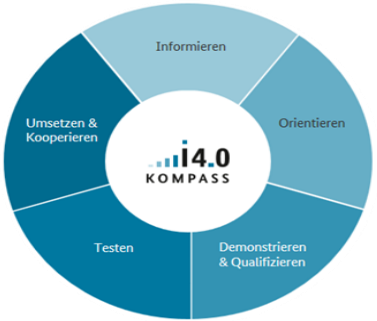
Finding Help for the Digital Transformation

Online Map
online with 317 examples of application

Library
online over 50 own publications

Compass
Finding tailor-made support





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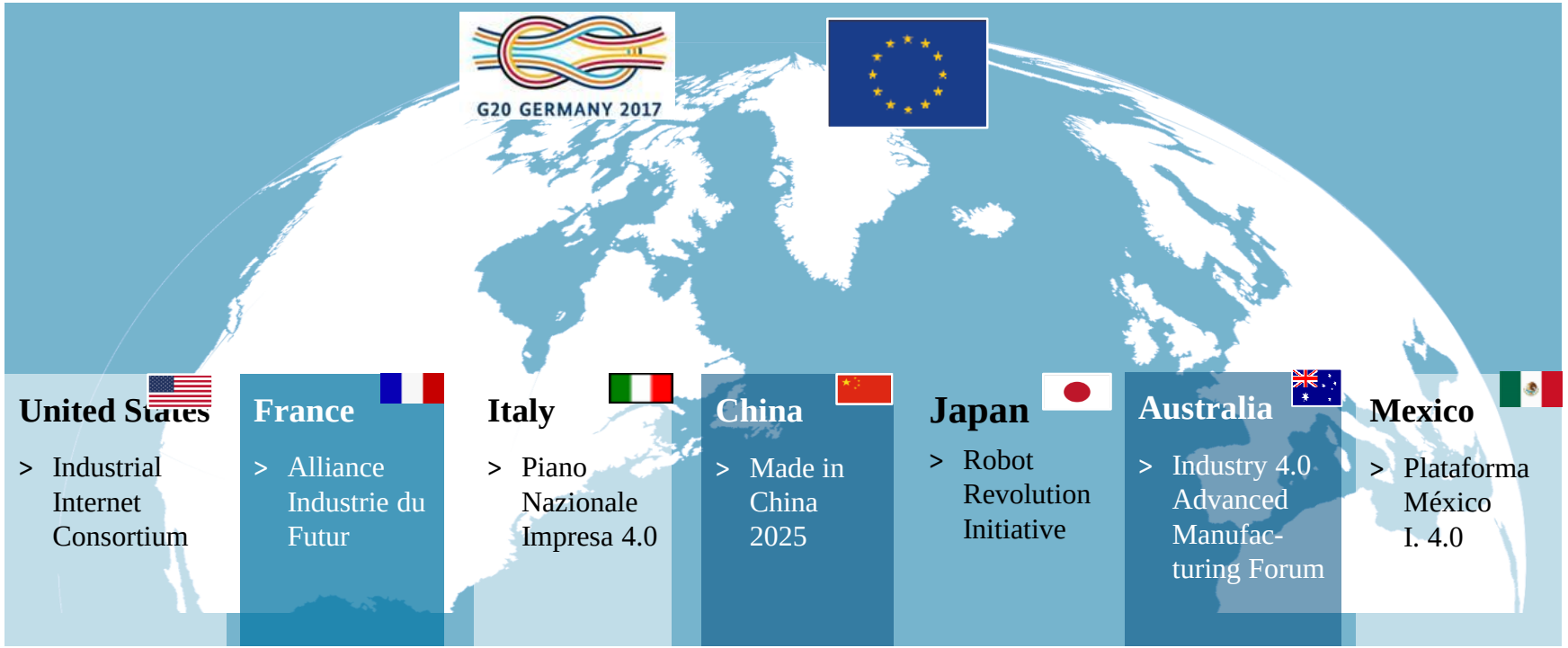
International Cooperation – Multilateral/Bilateral

Need for Global Standards and Solutions



United States

> Industrial Internet Consortium

France

> Alliance Industrie du Futur

Italy

> Piano Nazionale Impresa 4.0

China

> Made in China 2025

Japan

> Robot Revolution Initiative

Australia

> Industry 4.0 Advanced Manufac-turing Forum

Mexico

> Plataforma México I. 4.0

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Thank you for your attention !