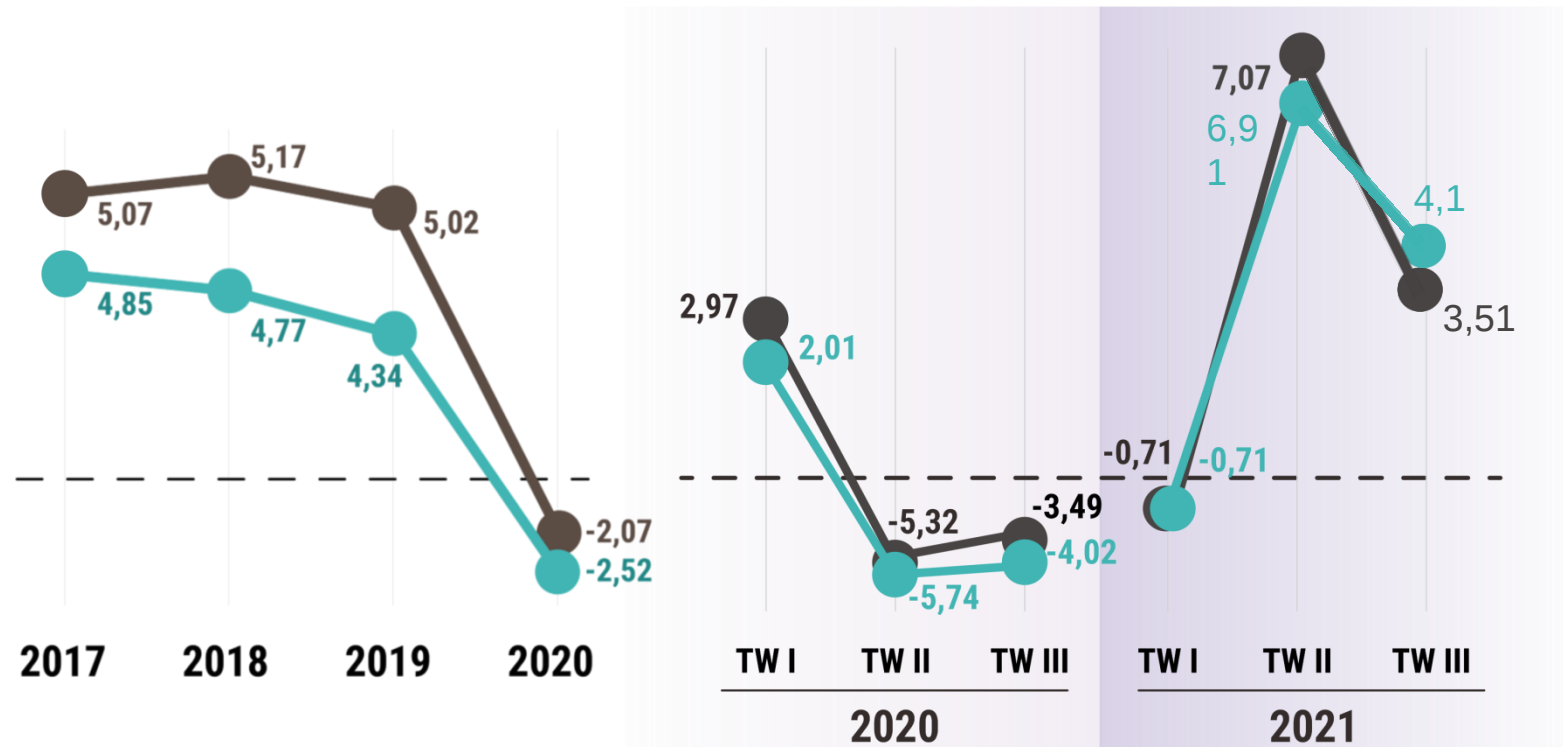


# INDUSTRY 4.0 IMPLEMENTATION IN INDONESIA

Presented at:  
**Sweden Indonesia Sustainability Partnership (SISP) Week**  
Jakarta, November 26<sup>th</sup>, 2021

**Dr. Ir. HERU KUSTANTO, M.Si**  
**Director of Cenfer for Optimizing Industrial Technology Utilisation and  
Industrial Service Policy**  
**Ministry of Industry**  
**Republic of Indonesia**

## Economic Growth and Non-Oil and Gas Industry Third Quarter 2021 (%)



### 5 Big Non Oil and Gas Industrial Growth Q3 2021

- Transport Equipment Industry : 27,84
- Leather Industry, Leather goods and footwear : 18,12
- Machinery and Equipment Industry: 16,25
- Chemical, Pharmaceutical and Traditional Medicine Industry : 9,71
- Base Metal Industry : 9,52

■ Ekonomi ■ Pengolahan Nonmigas

### National Economic Growth (%)

|               |       |               |      |
|---------------|-------|---------------|------|
| JAN-SEPT 2020 | -2,03 | JAN-SEPT 2021 | 3,24 |
|---------------|-------|---------------|------|

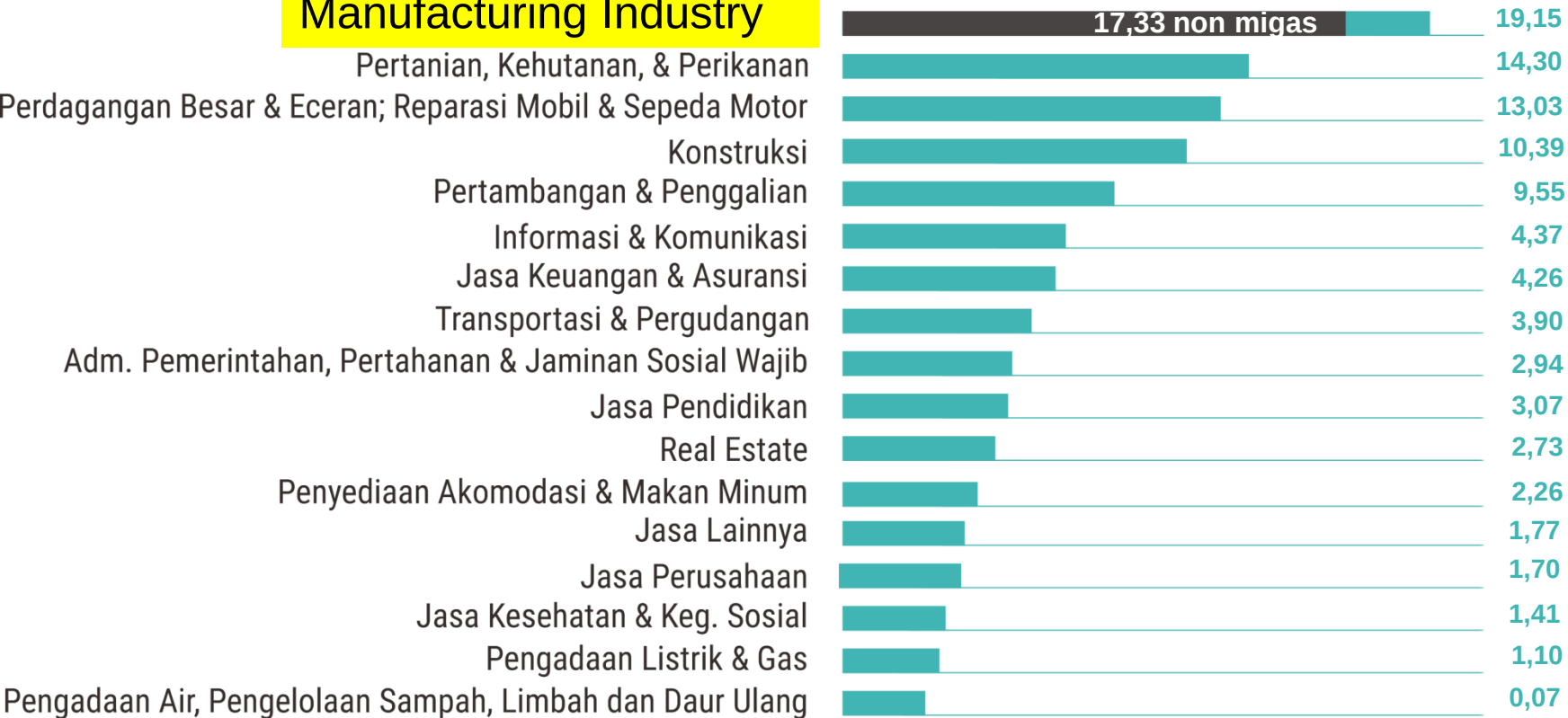
### Non Oil and Gas Manufacturing Growth (%)

|               |       |               |      |
|---------------|-------|---------------|------|
| JAN-SEPT 2020 | -2,63 | JAN-SEPT 2021 | 3,37 |
|---------------|-------|---------------|------|

Sumber: BPS diolah Kemenperin

## Contribution of the Economic Sector to The National GDP (%)

### Manufacturing Industry



### 5 Big Non Oil and Gas Contribution in Q3 2021



Food and beverage : **6,74**



Chemical, pharmaceutical and traditional medicine : **2,03**



metal goods industry, computers, electronics, optics, and electrical equipment : **1,43**

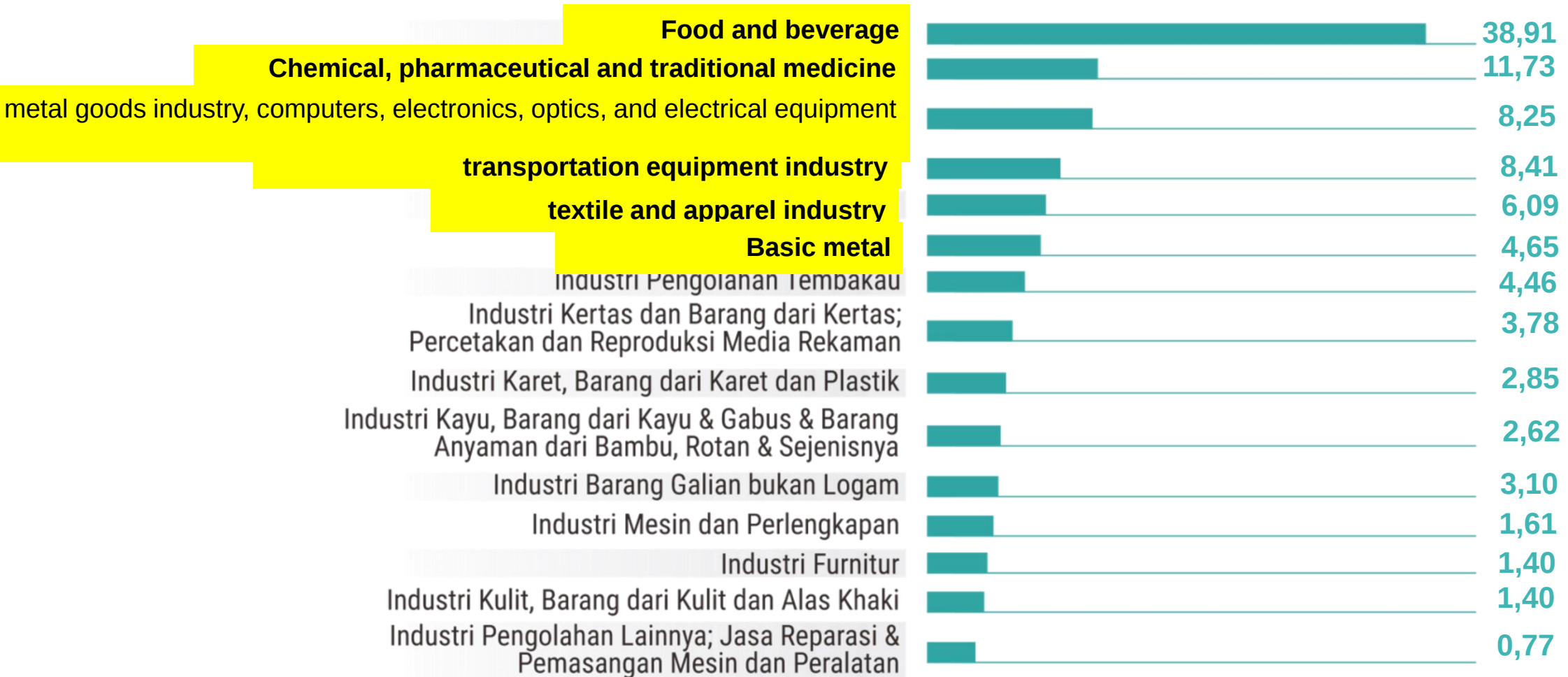


transportation equipment industry : **1,46**

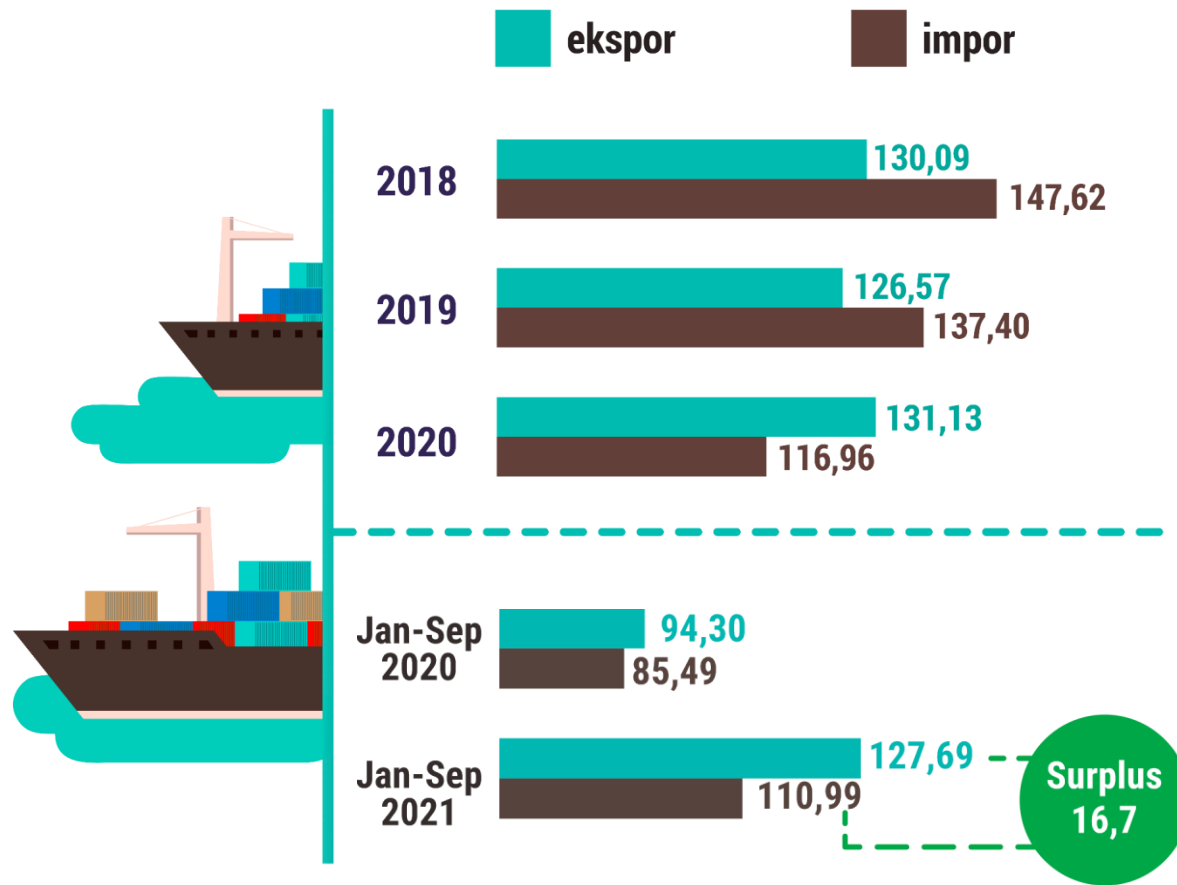


textile and apparel industry : **1,05**

## Contribution of the Sub-Sector Industry to The National GDP (%)



## Export and Import Value Industrial Sector Jan-Sep 2021 (USD Bilion)



**Industrial export contribution 77,72% to national total export USD 164,29 Billion**

### 5 Big Value Export

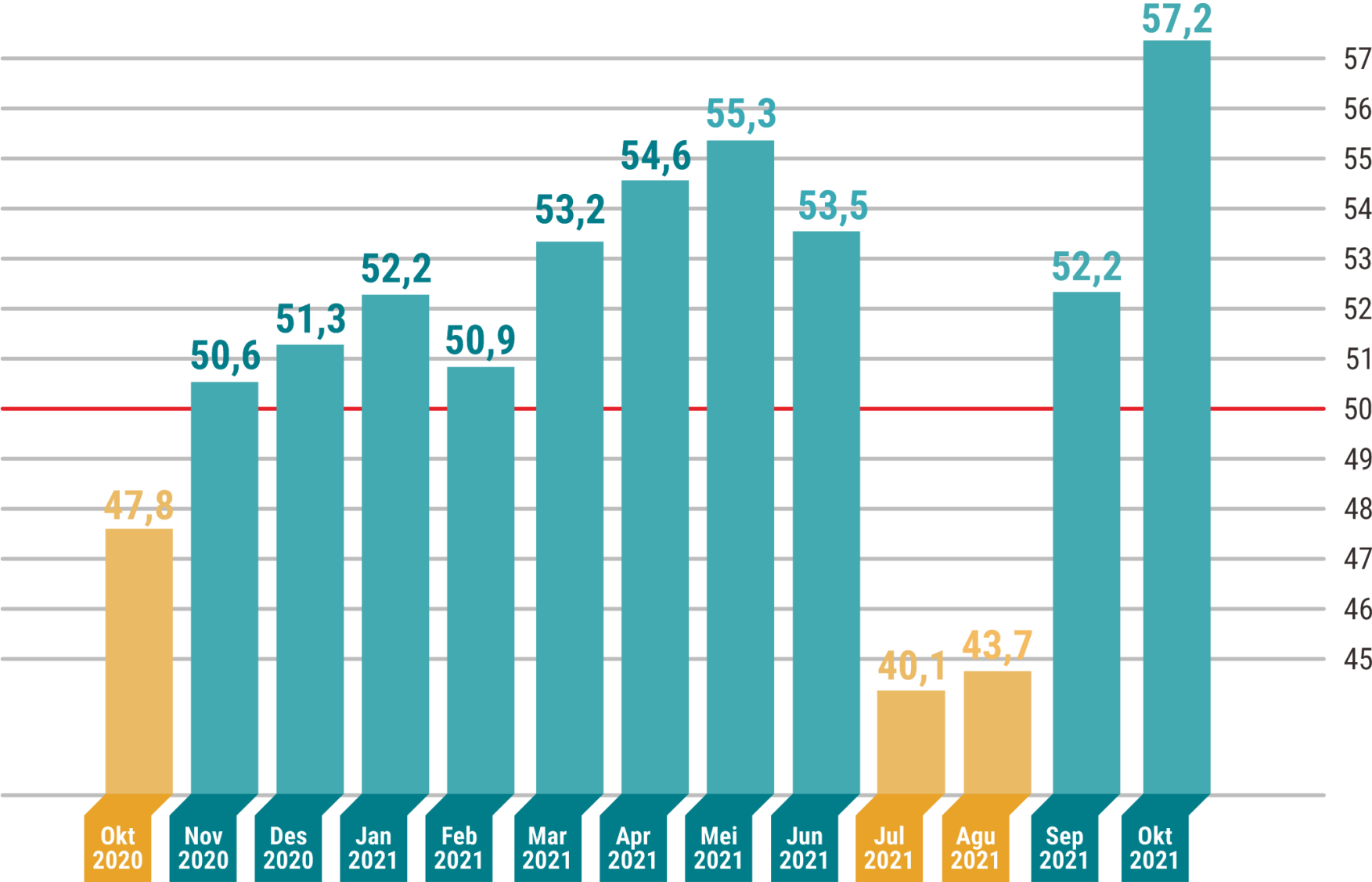
|  |                                                                                |         |
|--|--------------------------------------------------------------------------------|---------|
|  | Food and beverage                                                              | : 32,52 |
|  | Basic metal                                                                    | 2,37    |
|  | Chemical, pharmaceutical and traditional medicine                              | : 14,27 |
|  | metal goods industry, computers, electronics, optics, and electrical equipment | 11,65   |
|  | textile and apparel industry                                                   | 9,44    |

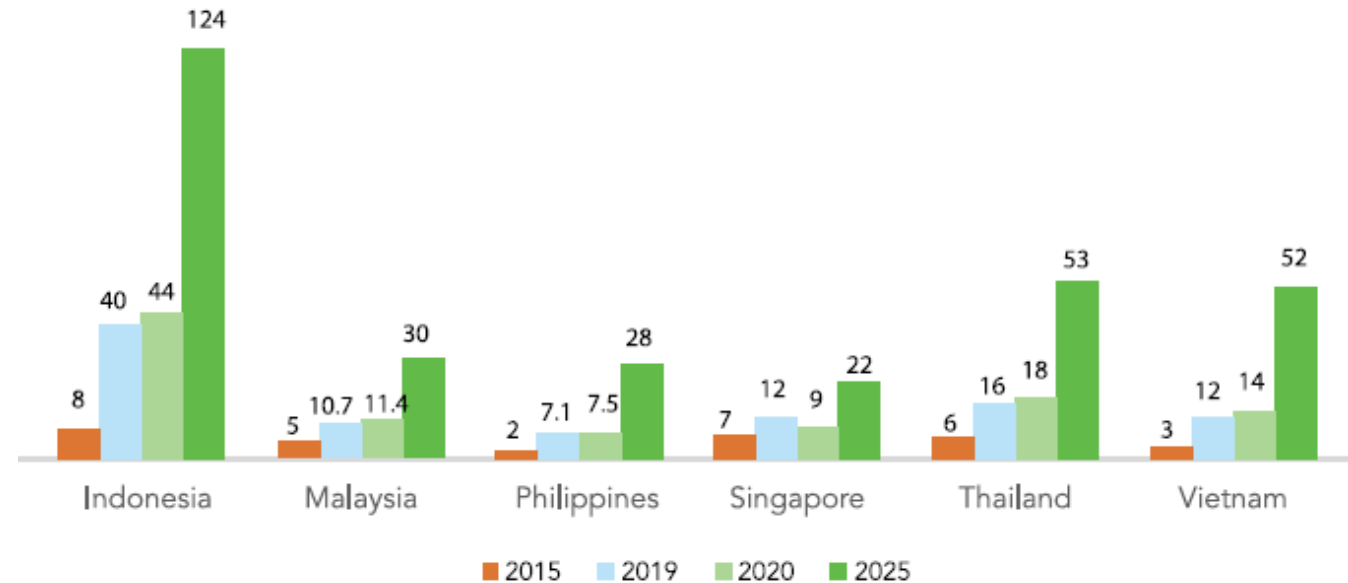
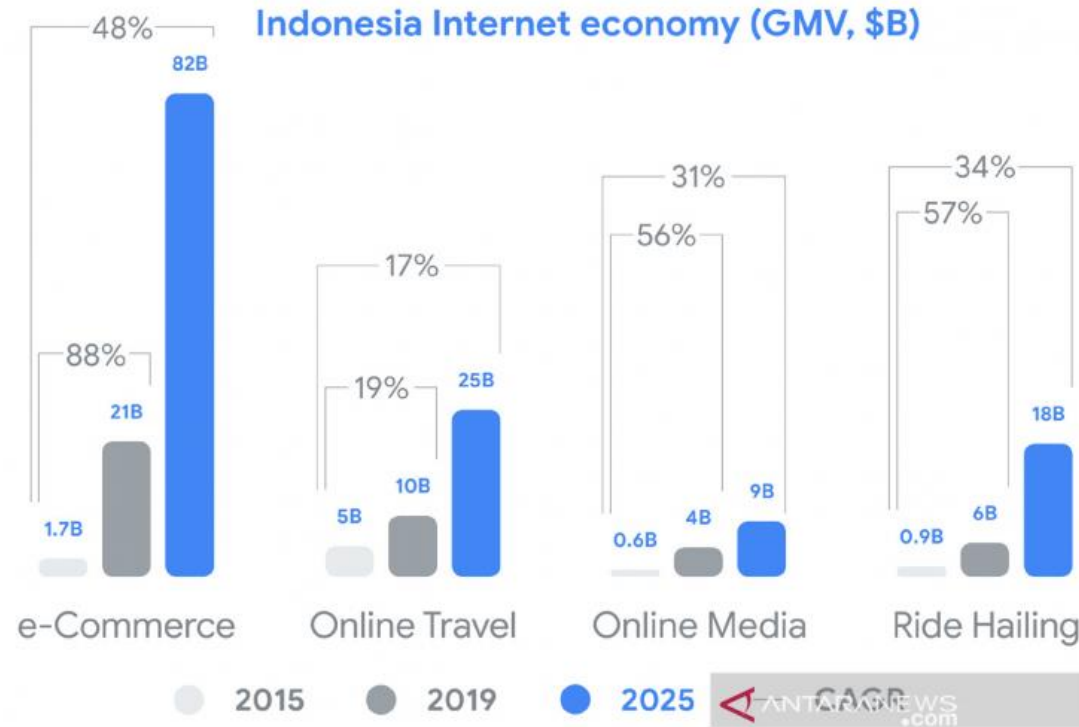
### 5 Big Value Import

|  |                                                                                |         |
|--|--------------------------------------------------------------------------------|---------|
|  | metal goods industry, computers, electronics, optics, and electrical equipment | 24,35   |
|  | Chemical, pharmaceutical and traditional medicine                              | : 22,25 |
|  | Machinery and Equipment Industry:                                              | 14,88   |
|  | Basic metal                                                                    | 4,01    |
|  | Food and beverage                                                              | : 10,13 |

Sumber: BPS diolah Kemenperin

# PURCHASING MANAGERS INDEX (PMI) INDONESIA





Indonesia has a fairly large digital economy potential. The development of the digital economy in Indonesia is inseparable from the continued growth in the number of internet users in Indonesia.

Source : Financial Services Authority Indonesia, 2020  
Antaranews

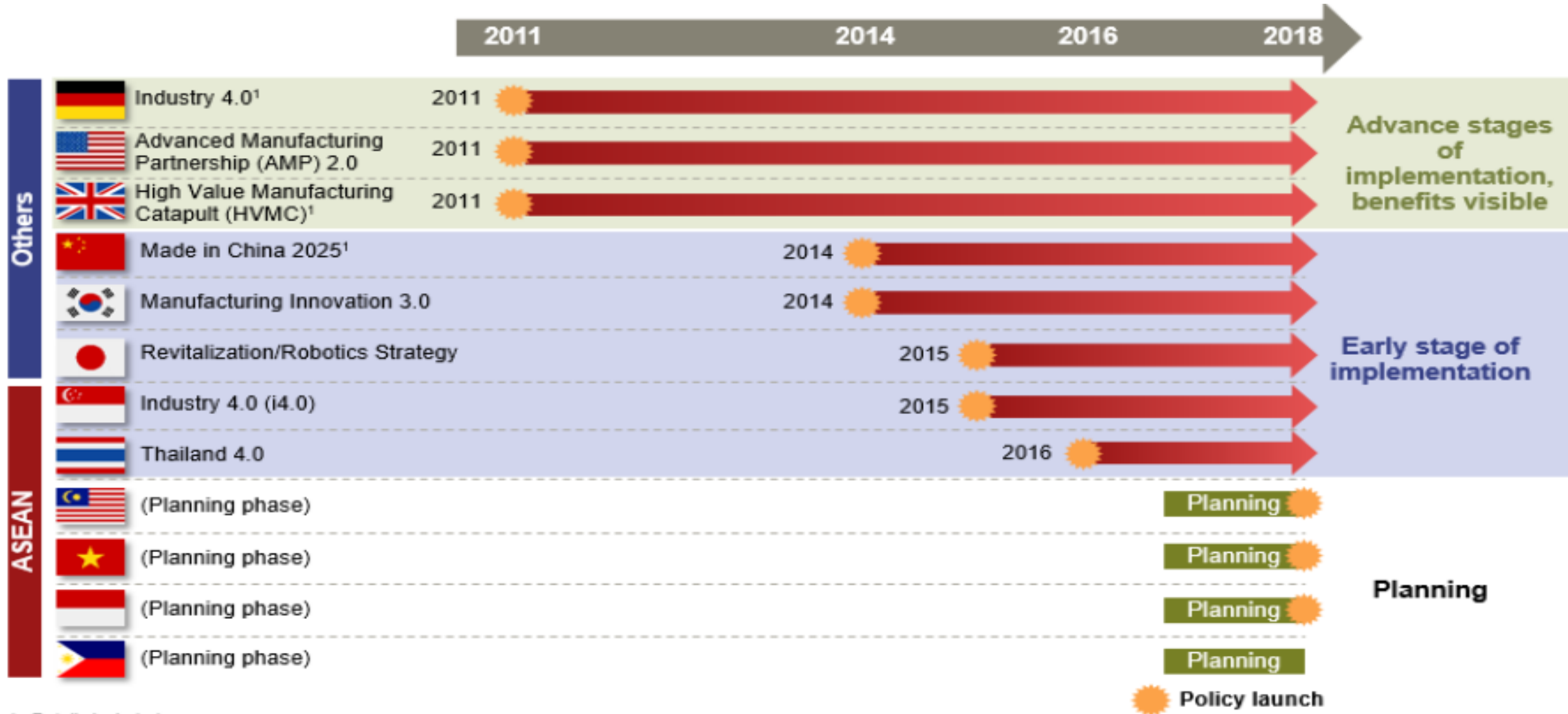
**Across key sectors, Indonesia could harness digitization to realize total productivity impact of USD 120 billion by 2025.**

USD billion

| Sector                      | Estimated 2025 GDP base impact | Operation optimization | Human health and productivity | Product and sales development |
|-----------------------------|--------------------------------|------------------------|-------------------------------|-------------------------------|
| Manufacturing               | 34.4                           | 29.4                   | 3.0                           | 2.0                           |
| Retail                      | 24.5                           | 12.5                   | 6.7                           | 5.3                           |
| Transport                   | 15.5                           | 13.6                   | 1.9                           | 0.0                           |
| Mining                      | 14.8                           | 14.0                   | 0.5                           | 0.3                           |
| Agriculture                 | 11.0                           | 10.6                   | 0.3                           | 0.0                           |
| Telecom and media           | 7.9                            | 5.7                    | 1.7                           | 0.5                           |
| Healthcare                  | 6.6                            | 2.2                    | 4.3                           | 0.0                           |
| Public sector and utilities | 4.8                            | 4.7                    | 0.1                           | 0.0                           |
| Financial                   | 1.8                            | 1.1                    | 0.1                           | 0.6                           |
| <b>Total</b>                | <b>121.4</b>                   | <b>93.8</b>            | <b>18.7</b>                   | <b>8.9</b>                    |

Source: Based on McKinsey Global Institute Study "Unlocking the potential of the Internet of Things," Team analysis adjusting figures for Indonesian context

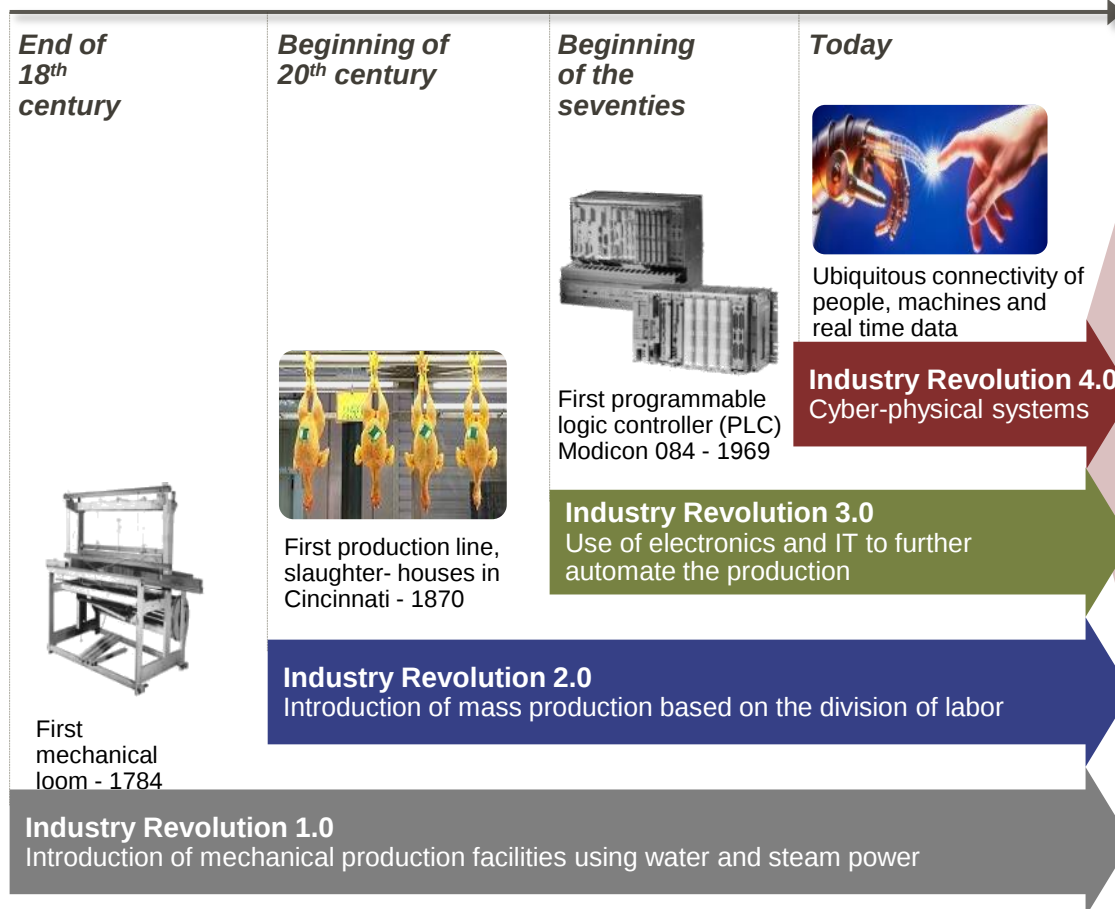
# Implementation Industry 4.0 in Others Countries



1. Details included

# Industrial Revolution (IR 4.0) utilizes the latest technology to link the physical, digital and biological spheres of production

## Industrial Revolution Timeline



## Key Technology of IR 4.0

### Artificial Intelligence (AI)



Technology to process information, think and make automated decision

### Internet of Things (IoT)



The internet interconnection of computing devices embedded in everyday objects

### Advanced Robotics



Robotics technology supplemented by Artificial Intelligence or IoT

### Wearables / Augmented Reality / Virtual Reality



The use of technology to enhance the functionality of everyday-worn-item

### 3D Printing



The use of technology in making a physical object from 3D digital model

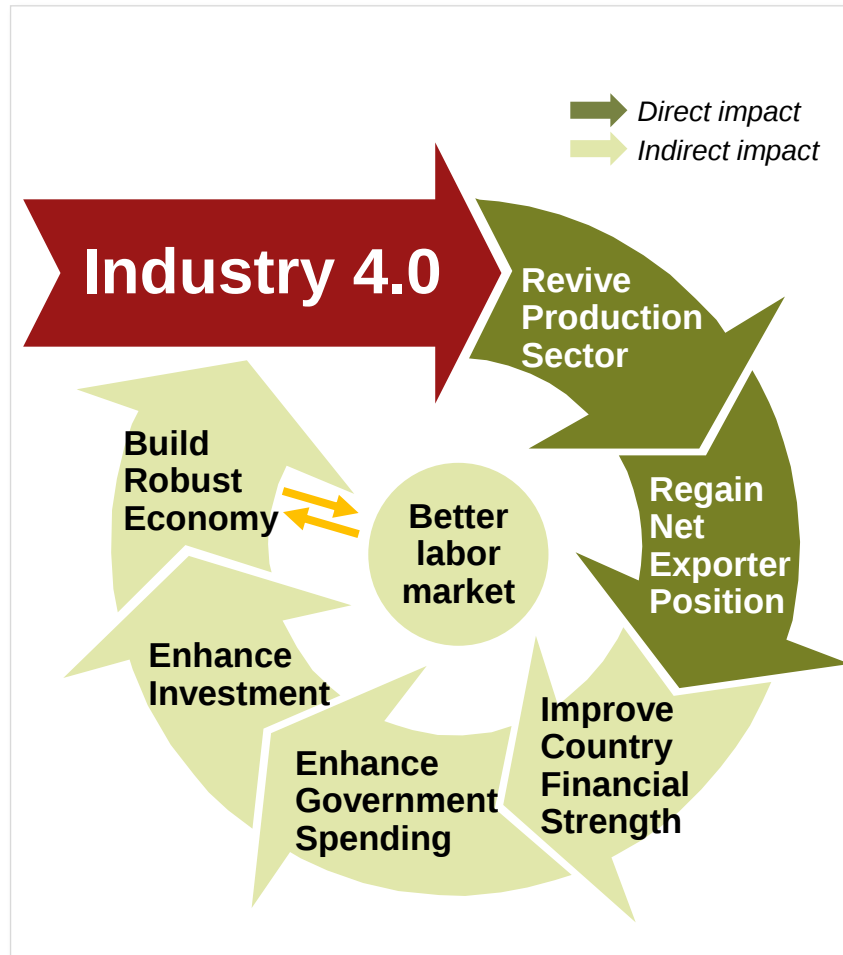


“Indonesia must utilize the revolution through *Making Indonesia 4.0*”

**President Joko Widodo**

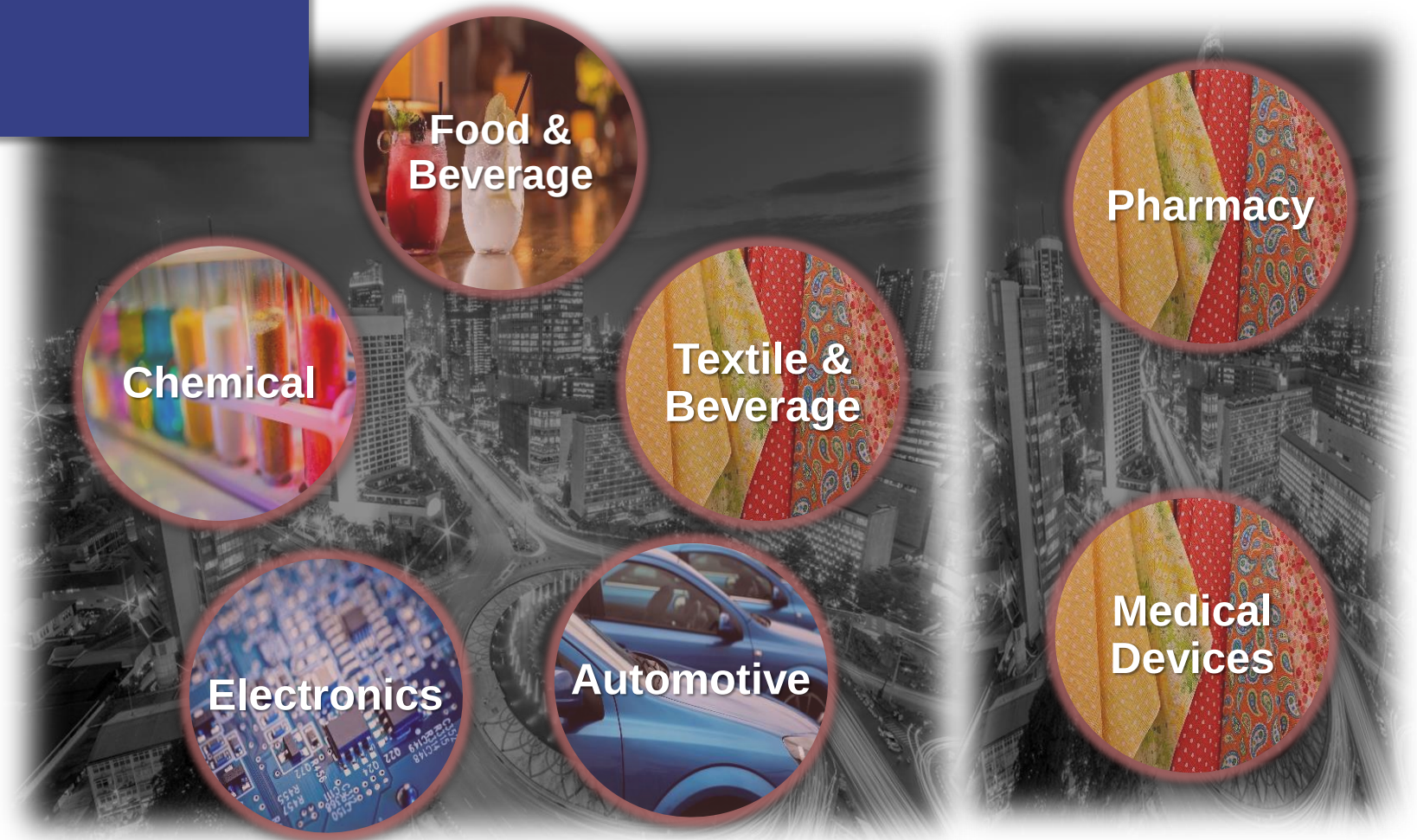
Launching of Making Indonesia 4.0 - – Jakarta, April 4, 2018

Industry 4.0 can revive the Indonesian manufacturing sector;  
Indonesia launch “Making Indonesia 4.0” initiative



1. Based on 2016  
2. Indonesia's R&D spending per GDP is currently around 0.1-0.3%  
Source: World Bank, A.T. Kearney

# 5 + 2 Priority Manufacturing Sectors for 4IR



Indonesia has set 10 National Priorities for “Making Indonesia 4.0”

## 10 National Priorities

### 1 Reform Material Flow

- Enhance **domestic upstream material production**; e.g. 50% of petrochemical is imported

### 2 Redesign Industrial Zones

- Build a **single nationwide industry zoning roadmap**; resolve zoning inconsistency challenges

### 3 Embrace sustainability

- Grab **opportunities under global sustainability trend**; e.g. EV, biofuel, renewables

### 4 Empower SMEs

- Empower **3.7 million SMEs<sup>1</sup> by technologies**; e.g. build SME e-commerce, technology bank

### 5 Build Nationwide Digital Infrastructure

- Advance **network and digital platform**; e.g. 4G to 5G, Fiber speed 1Gbps, Data center and Cloud

### 6 Attract Foreign Investments

- Engage **top global manufacturers** with attractive offer and accelerate **technology transfer**

### 7 Upgrade Human Capital

- Redesign **education curriculum** under 4IR era
- Create professional **talent mobility program**

### 8 Establish Innovation Ecosystem

- Enhance **R&D centers** by government, private sector and universities

### 9 Incentive Technology Investment

- Introduce **tax exemption/subsidies** for technology adoption and **support funding**

### 10 Reoptimize Regulations & Policies

- Build more **coherent policies/regulations** by **cross-ministry collaborations**

“Making Indonesia 4.0” can create massive uplift in overall GDP, manufacturing contribution & employment opportunity

## Estimated Benefits<sup>1</sup> of “Making Indonesia 4.0” Implementation

### GDP Growth

**+1-2% p.a.**  
incremental GDP  
growth from  
baseline in 2018-  
2030

### Job Creation

**>10 Million<sup>3</sup>**  
additional  
employment  
opportunity from  
baseline by 2030

### Manufacturing GDP Contribution

**>25%** of  
manufacturing GDP  
contribution by  
2030

1. Benefits are estimated based on the incremental difference between the aspirational case and the base case in A.T. Kearney economic models
  2. In the base case, real GDP growth is estimated at ~5% YoY between 2018-2030, additional jobs created is estimated at ~22 million by 2030 and manufacturing contribution is estimated at ~16% of total Indonesian GDP in 2030
  3. Industry 4.0 implementation can absorb 30~50% of the 30 million additional working age population by 2030; The rest of the workforce are already absorbed in the base case scenario
- Source: World Bank, Badan Pusat Statistik, Ministry of Industry, A.T. Kearney

## Indonesia Industry 4.0 Readiness Index (INDI 4.0)

### **WHAT IS INDI 4.0 ?**

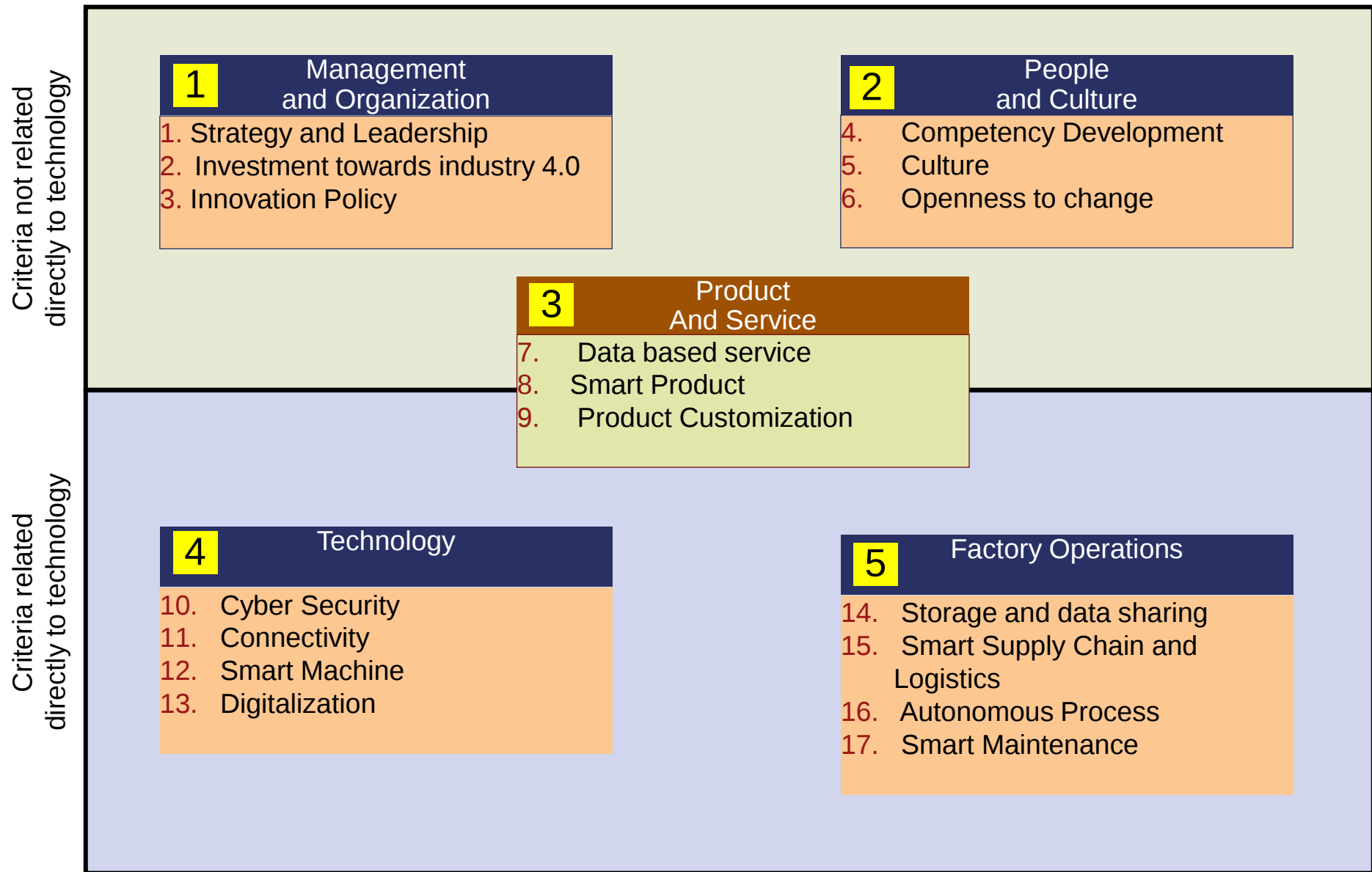
Indonesia Industry 4.0 Readiness Index (INDI 4.0) is a reference index used by industry and government to measure the level of industry readiness towards Industry 4.0

# Indonesia Industry 4.0 Readiness Index (INDI 4.0)



# Indonesia Industry 4.0 Readiness Index (INDI 4.0)

**INDI 4.0**  
**5**  
**PILARS**  
**17**  
**FIELDS**



- Companies that are selected and considered capable of being **role models for other industries** in the transformation and implementation of 4<sup>th</sup> IR to encourage financial/economic, operational and technological impacts.
- Able to act as a beacon **to guide other industries** in the application of 4<sup>th</sup> IR -related technologies such as artificial intelligence, additive manufacturing and advanced analytics as well as overcome challenges in upgrading existing production systems.
- **As a showcase or demonstration** of digital manufacturing that has been implemented by an industry so that it can provide a real picture of the success of an industry in obtaining benefits from the implementation that has been carried out and can assist in the adoption of technology by other industries.





2 Industries –  
Global Lighthouse  
Network  
By WEF

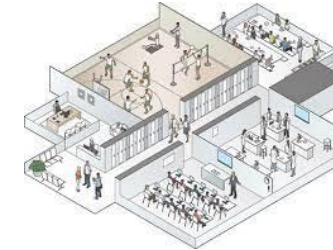
3 Industries –  
National Lighthouse  
By Kemenperin

**5 Lighthouse  
Industries**



Digital  
Ecosystem for  
SME Growth  
through E-  
Smart IKM

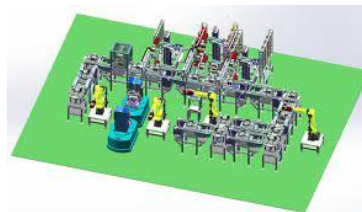
**13.184 SMEs  
Connected**



Completed Training  
for Transformation  
Management  
Industry 4.0

**760  
Transformation  
Mangers for  
Industry 4.0**

**775 Industries**  
On INDI 4.0  
Self- assesment



**45 Industries**  
In Assistance to  
Industry 4.0  
Trnsformation



**8 Capability  
Center**

1 Digital Capability  
Center for Industry 4.0

4 Satelite Capability  
Centers

3 Learning Factories





**PT. INDOLAKTO**

Food and Bavarage

**POLYTRON**

PT Hartono Istana Teknologi

Electronic

  
**PT. PAN BROTHERS Tbk**

Textile

 **TOYOTA**  
**INDONESIA**  
PT Toyota Motor Manufacturing Indonesia

Automotive

**PUPUK**  **KALTIM**

Chemical



## Indonesia Industry 4.0 Lighthouse



Media | News Releases

The World Economic Forum welcome  
10 new factories into its global lighthouse network  
(2 new factories in Indonesia)



### Scaling Intelligent Manufacturing: 10 Factories Leading the Way in Innovation

Published  
03 Jul 2019

2019

Share



Oliver Cann, Public Engagement, Tel.: +41 79 799 3405;  
[oliver.cann@weforum.org](mailto:oliver.cann@weforum.org); Muzi Li, Public Engagement, Tel.: +86 139 1046 6369;  
[muzi.li@weforum.org](mailto:muzi.li@weforum.org)

**Scaling Intelligent Manufacturing: 10 Factories Leading the Way in Innovation**

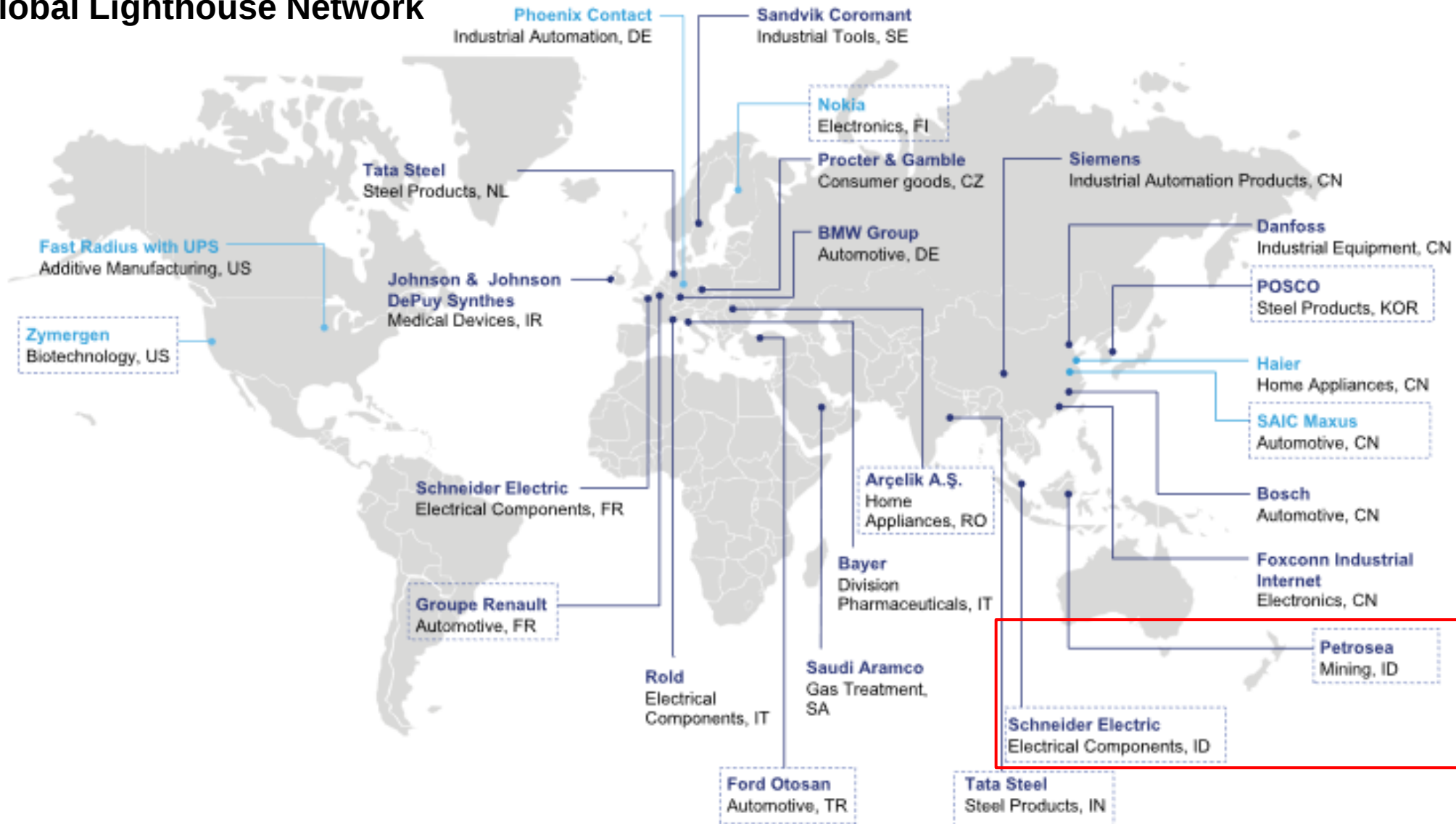
• The World Economic Forum welcomes 10 new factories into its global Lighthouse Network



**Schneider Electric (Batam, Indonesia):** One of Schneider Electric's nine smart factories, this location developed a full spectrum of Fourth Industrial Revolution solutions (e.g., IIoT platform) that were then shared with the wider Schneider Electric community, including customers and partners, thereby improving the operations of the entire ecosystem.



**Petrosea (Tabang, Indonesia):** Challenged by its remote location, this mining service provider deployed multiple Fourth Industrial Revolution use cases (e.g. optimized truck dispatch, real-time monitoring, drone surveys) that transformed the mine from a loss-making entity into a profitable one in just six months.



# Indonesia National Lighthouse Industry 4.0

- Companies that are selected and considered capable of being **role models for other industries** in the transformation and implementation of 4<sup>th</sup> IR to encourage financial/economic, operational and technological impacts.
- Able to act as a beacon **to guide other industries** in the application of 4<sup>th</sup> IR -related technologies such as artificial intelligence, additive manufacturing and advanced analytics as well as overcome challenges in upgrading existing production systems.
- **As a showcase or demonstration** of digital manufacturing that has been implemented by an industry so that it can provide a real picture of the success of an industry in obtaining benefits from the implementation that has been carried out and can assist in the adoption of technology by other industries.



**PT INDOLAKTO**

**PUPUK KALTIM**

**AIKEBONO**



- Dairy product producers include: UHT liquid milk, powdered milk, butter and sweet condensed milk (SCM)

## ■ Change Story

The journey of digitization begins with the spirit of continuous improvement as the initial foundation in technology adoption. the purwosari factory was built as a fully automated factory then developed with the smart factory concept by the digital transformation team by integrating both vertically and horizontally

## ■ Top 5 Use Cases

1. Smart Quality
2. Smart Maintenance
3. Smart Performance
4. Smart Production
5. Smart Eco Factory

# PT INDO<sup>®</sup>LAKTO

Purwosari – East Java



## ■ Impact

- 70% Nonquality Cost
- 6% Line Efficiency
- 4% Productivity



## Bontang – East Kalimantan

- The largest producer of urea and ammonia in Indonesia, besides that it also produces NPK and biofertilizers
- **Change Story**  
Digital transformation and the company's commitment are the keys to success in accelerating the transformation of Industry 4.0 in Pupuk Kaltim.  
The company's commitment is evidenced by the formation of a digital transformation team and an industry 4.0 transformation team that successfully integrates all company business processes to increase company productivity, quality and flexibility.  
In addition, this success also supports the development of the industrial 4.0 ecosystem in Indonesia



- **Top 5 Use Cases**
  1. Smart Production
  2. Smart Maintenance
  3. Digital Performance Management System
  4. Smart Distribution
- **Impact**
  - 12.6% Labor Productivity
  - 15.6% Operational Cost Efficiency
  - 4.8% Energy Efficiency
  - 3.1% Production Rate
  - 3.2% Plant Realibility Index

- Company in the automotive sector that produces foundation brake and friction materials for pad and lining
- Change story  
Starting with smart office activities that encourage HR involvement to design new offices, with digital and environmentally friendly concepts, followed by smart factory activities by implementing industry 4.0 to increase productivity and improve quality with the direction of the company and project owners
- **Top 5 Use Cases**
  1. Smart Quality Management System
  2. Smart Maintenance
  3. Realtime Production Monitoring
  4. Smart Dies Management
  5. Process Condition Connectivity and Traceability

**AKESBOTO**

**Jakarta – DKI Jakarta**



- **Impact**
  - 8% Productivity
  - 30% Reject Ratio
  - 12% Operational Efficiency



**PUSAT INDUSTRI DIGITAL INDONESIA 4.0  
(INDONESIA DIGITAL INDUSTRIAL CENTER 4.0/PIDI 4.0)**



## MAIN SERVICES PIDI 4.0

PIDI 4.0 as a one-stop solution for the adoption of industry 4.0 offers 5 main services to help the industry transform to industry 4.0.

### 1. Showcase Center

A place to witness and have direct experience of the implementation of Industry 4.0 through a factory & miniplant model that has implemented industrial technology 4.0

### 2. Capability Center

Industrial human resource development center for Indonesian workers (from CxO to frontline) and ASN of the Ministry of Industry

### 3. Ecosystem for Industry 4.0

A place for all industry 4.0 stakeholders to share and work together in their business transformation process

### 4. Delivery Center

Assistance and consulting center for industry in transforming to industry 4.0

### 5. Engineering & AI Center

PIDI 4.0 as a research brokerage and test-bed to find solutions from industrial pain points in transforming to industry 4.0

**5 PIDI 4.0 Services for Making Indonesia 4.0**  
Transform your business now !!!

# Expected Collaboration between Indonesia (Mol) and Sweden in Implementation of Industry 4.0

- Joint studies related to policies in each country in accelerating the implementation of Industry 4.0
- Increasing the ability of human resources, both apparatus human resources and industrial human resources to increase knowledge and skills to support Industry 4.0 through education and training activities and internships in Japanese industries that have implemented Industry 4.0 both in small and medium industries or in large industries
- Consultation, guidance and assistance in several priority industries such as the food and beverage industry, chemical industry, electronics industry, automotive industry, textile and apparel industry, pharmaceutical industry, and medical device industry in the implementation of Industry 4.0
- Cooperation in the operation of the Indonesian Digital Industry Center (PIDI 4.0)
- Making a pilot project for the application of industry 4.0 for small and medium industries
- Encouraging investment in the industrial sector based on industrial technology 4.0 to Indonesia
- Development of process standards and standards for machines and equipment used in industry 4.0

# Thank You



**Ministry of Industry – Republic of Indonesia**

Jl. Gatot Subroto Kav. 52-53,

Jakarta 12950 – INDONESIA

[www.kemenperin.go.id](http://www.kemenperin.go.id)



Kementerian  
Perindustrian RI



@Kemenperin\_RI



@kemenperin\_ri



Kementerian  
Perindustrian RI