



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION



SUSTAINABLE DEVELOPMENT GOAL 9
INDUSTRY, INNOVATION AND INFRASTRUCTURE

Industrialización y Megatendencias de la Nueva Política Industrial

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8 Septiembre 2020





Contenido de la presentación

1. La industrialización: motor de crecimiento y generador de empleo de calidad
2. Las dos megatendencias en la nueva política industrial: la industria 4.0 y la economía circular





La importancia de la industrialización y la transformación productiva a escala global



El sector académico siempre lo tuvo claro...

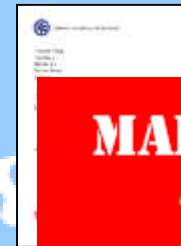
“Industrialization remains an engine of development, structural change and technological growth and modernization, growing manufactured trade is a sign that this engine is working” (Lall 2000)

“History has repeatedly shown that **the single most important thing that distinguishes rich countries from poor ones is basically their higher capabilities in manufacturing**, where productivity is generally higher and grow faster than in agriculture and services” (Chang, 2007. Bad Samaritans)

“Recent research confirms **manufacturing has been immensely important to the prosperity of nations**, with over 70% of the income variations of 128 nations explained by differences in manufactured product export data alone” (WEF 2012, The future of manufacturing to drive economic growth)



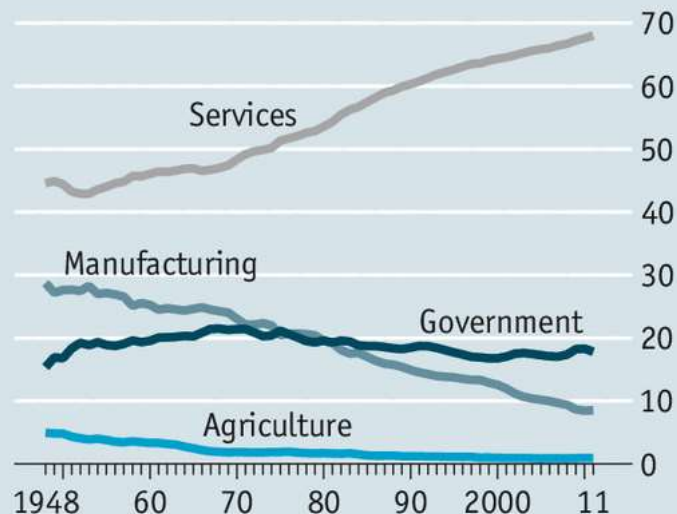
El debate sobre industrialización ha vuelto con fuerza...



...incluso en los países que renegaban
(e independientemente de la administración)

Not what it was

US employment by sector, % of total employment



Source: US Bureau of Labour Statistics



"Our first priority is making America a magnet for new jobs and manufacturing"
State of the Union Address, Feb. 12, 2013



"We want products made by our workers in our factories stamped with those four magnificent words — made in the USA,"
Speech at Boeing Facility, Feb. 17, 2017

Fareed Zakaria

... y en la prensa mas escéptica



The Case for Making It in the USA

Like it or not (I don't), America needs a manufacturing policy to stay competitive

IN A RECENT FRONT-PAGE STORY, THE New York Times detailed how Apple's iPhone ended up being made outside the U.S. In describing the various forces at work—cheap labor, abundant engineers, quick turnarounds—the Times wrote about the Apple executives who visited a factory in China to see if it could cut the glass precisely for the phone's touchscreen. When the Apple team got there, the factory owners were already constructing a new plant. "This is in case you give us the contract," the owners explained. How could they afford such an extravagant gesture? It turns out, the Times noted, that they received subsidies from the Chinese government.

The story caught my eye because it is part of a pattern. President Obama spoke forcefully in his Jan. 24 State of the Union address about the importance of reviving manufacturing in America. Economists tell us it's a complex matter involving tax, trade and regulatory policy, exchange rates and educational skills. It is. But when you move from high-level policy to specific cases, you will often find one element that is rarely talked about: a foreign government's role in boosting its domestic manufacturers with specific loans, subsidies, streamlined regulations and benefits. In effect, these governments—many in Asia, though some in Europe as well—have a national industrial policy to help manufacturers.

In 2009, when Bridgelux, a light-emitting-chip manufacturer, was searching for a new factory site, the company considered the cost of building in the U.S. or elsewhere. The government of Singapore offered to pay half the setup cost of the plant. "Why can't we do that here in the U.S.?" CEO Bill Watkins asked. "The rest of the world is chewing us up alive."

Andrew Liveris, CEO of Dow Chemical Co., has also been arguing for a national policy aimed at reviving manufacturing. Companies cannot compete with countries, he notes in his book, *Make It in America*.

Liveris argues that not only would a manufacturing policy produce good long-term jobs, it would also upgrade the work skills that are crucial to keeping innovation alive. "Innovation doesn't just happen in laboratories by researchers," he told me.



"It happens on the factory floor. The process of making stuff helps you experiment and produce new products. If everything is made in China, people there will gain the skills, knowledge and experience to innovate. And we will be left behind." He worries that with tablets like the iPad and Kindle being made mostly in Asia, the next generation of these products could well be imagined there.

Take solar energy, an industry largely invented in the U.S. but in which the manufacturing has mostly moved to China. The CEO of Evergreen Solar, Michael El-Hillow, decided that he had to move one of his plants to China to reduce costs. "In December 2008, we were approached by a Chinese company, Jiawei, which was impressed with our wafer technology," he recounts. "The Chinese government agreed

to support a loan that would cover two-thirds of our expansion in China." The subsidies offered by the Massachusetts government, by contrast, covered about 5% of the cost of the company's U.S. plant. Last year Evergreen filed for bankruptcy, having unquestionably been undone by cheap Chinese competition. But Evergreen's Chinese factory will continue to operate, with Jiawei inheriting all its technology and know-how.

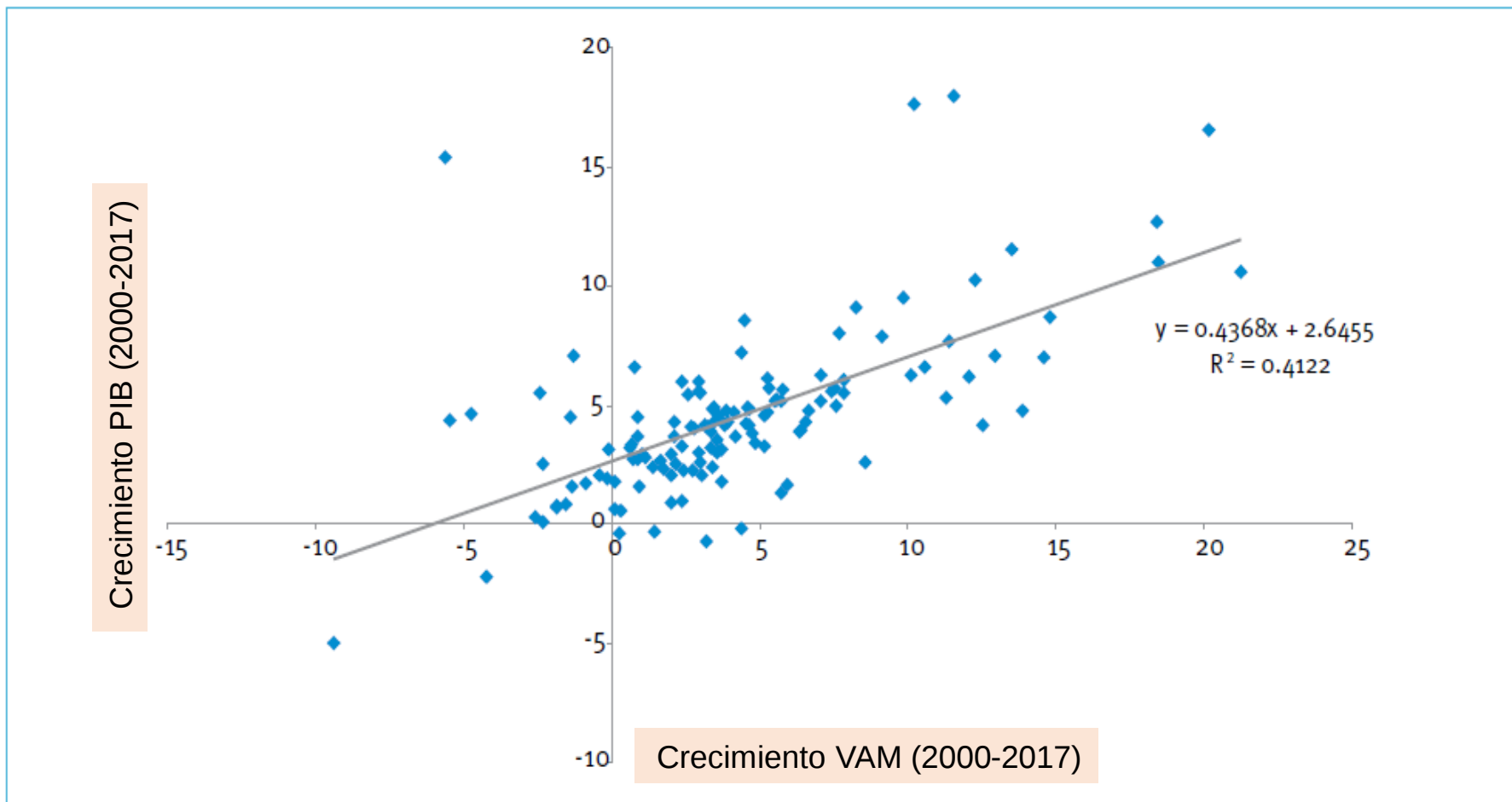
Or consider wind turbines. China's biggest windmill makers, Sinovel Wind Group Co. and Xinjiang Goldwind Science & Technology Co., have received more than \$15.5 billion in credits from state-owned banks. As a result, despite many concerns about quality, they won their first major foreign orders in the past year. They

plan to establish plants abroad, including China's first in the U.S. Over time, they will gain experience, improve quality and further reduce costs. In industry after industry, the same pattern emerges.

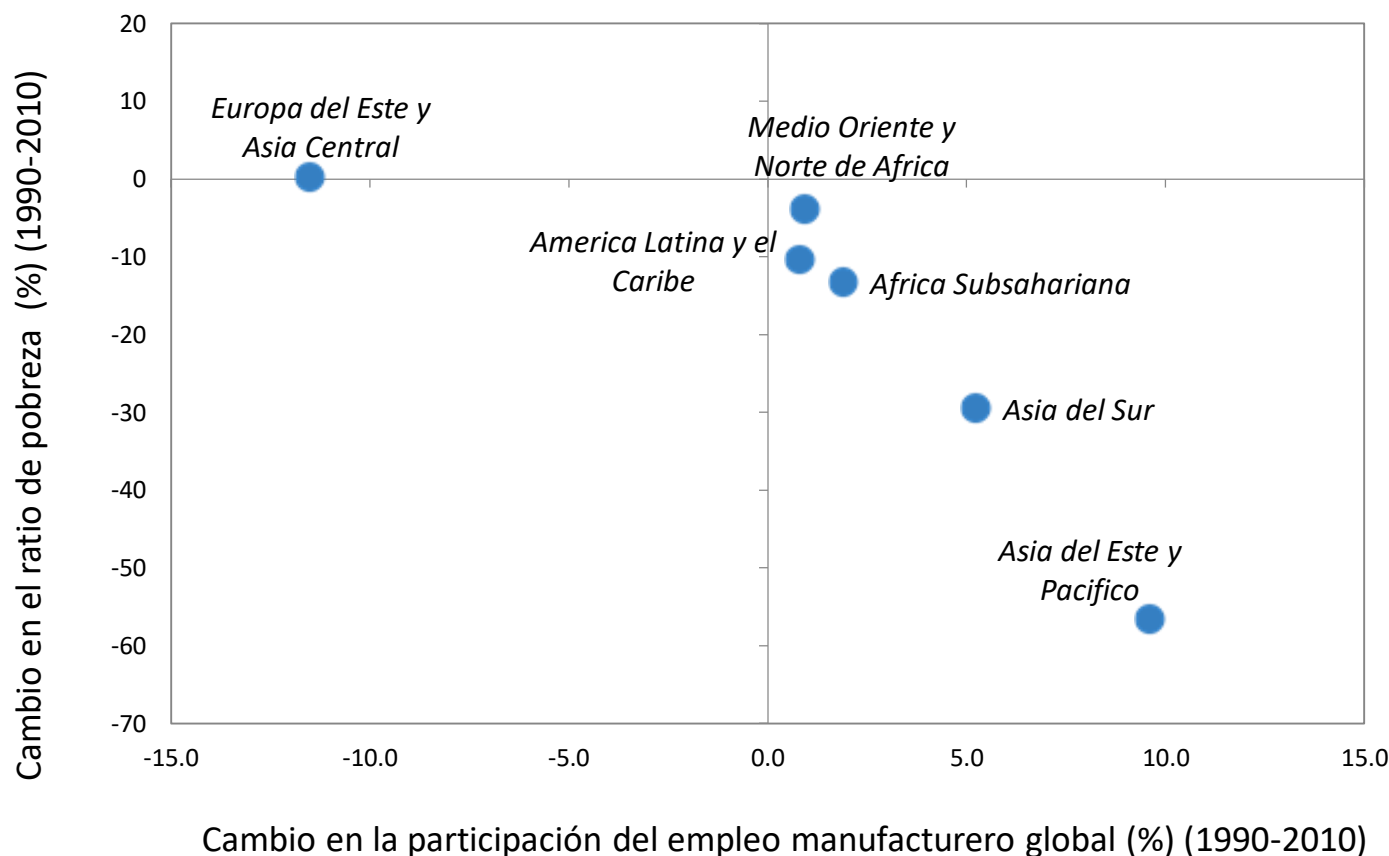
In theory, I am deeply skeptical of government industrial policy. Government doesn't know

how to pick winners and losers, it will make mistakes, and the process will get politicized. All this is true. And yet when I look at China and South Korea and also Germany and Japan, I see governments playing a crucial role. They do make mistakes—their versions of Solyndra—but they seem to view them the way venture capitalists would. Their role is to seed many companies, only a few of which will succeed. Once these companies are identified, government helps them compete against big U.S. multinationals. There used to be a joke about Marxist economists who would say of a deviation from pure communist economics: "It might work in practice, comrade, but it doesn't work in theory." That's what industrial policy looks like these days. The theory doesn't make sense, but it's hard to argue with the result.

Industrialización: motor de crecimiento económico...

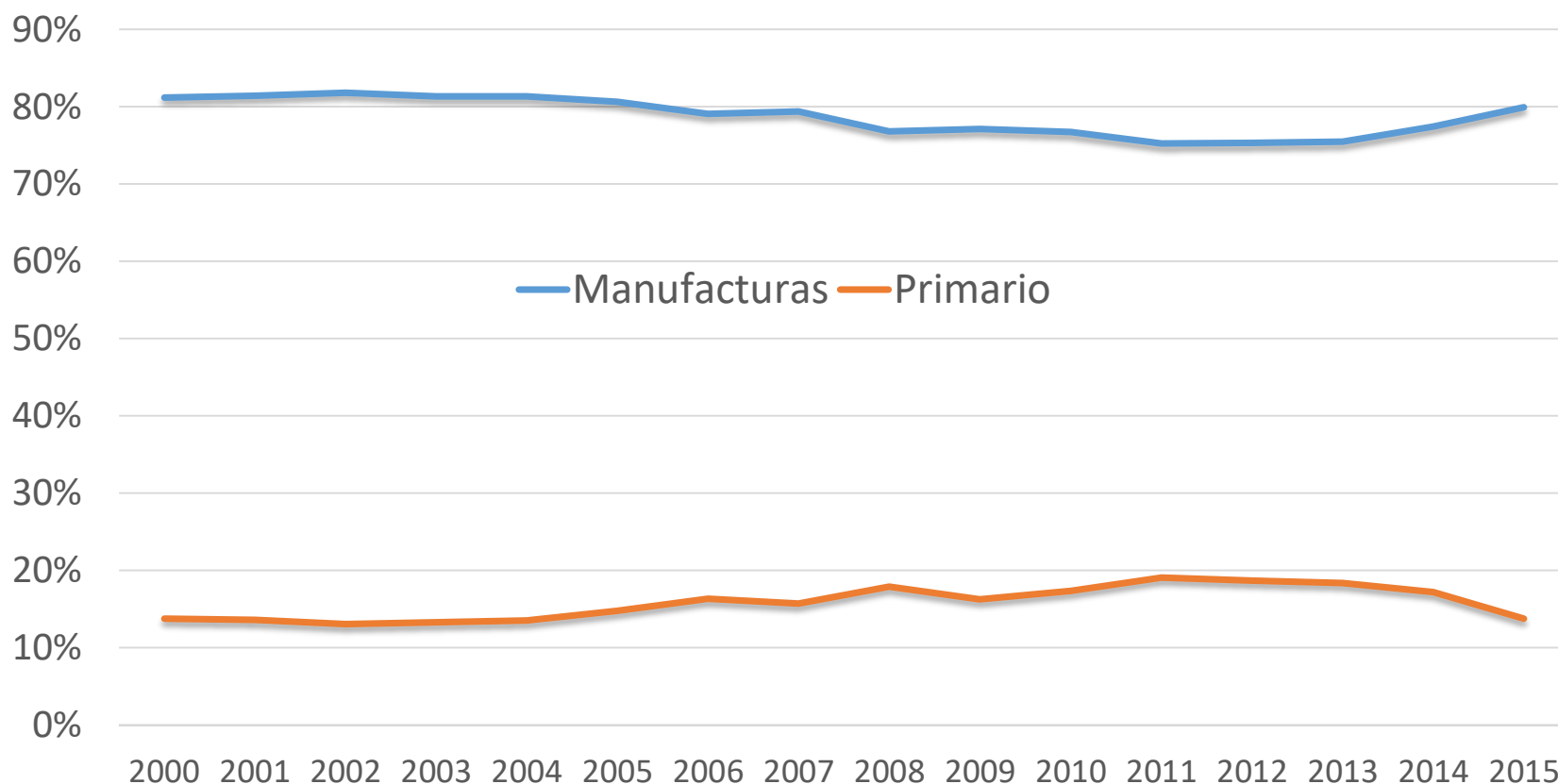


...con un impacto significativo en la reducción de la pobreza



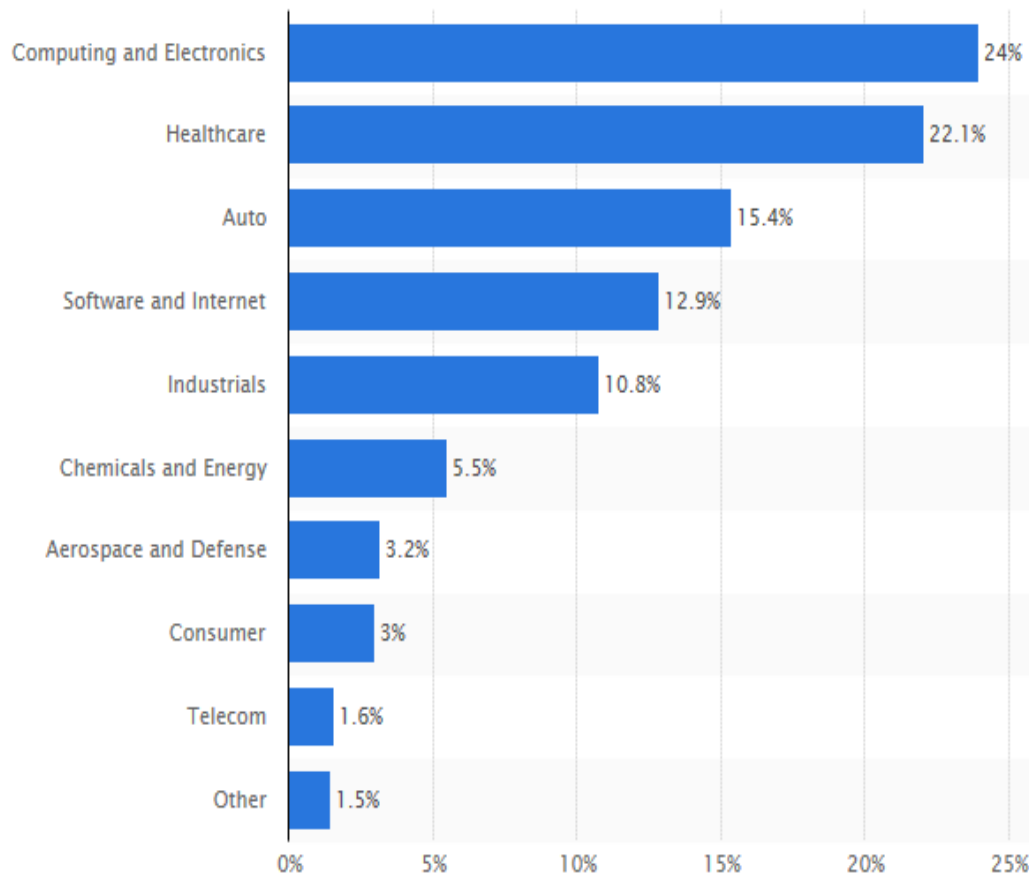
La manufactura domina el comercio mundial...

Estructura del comercio mundial (%)



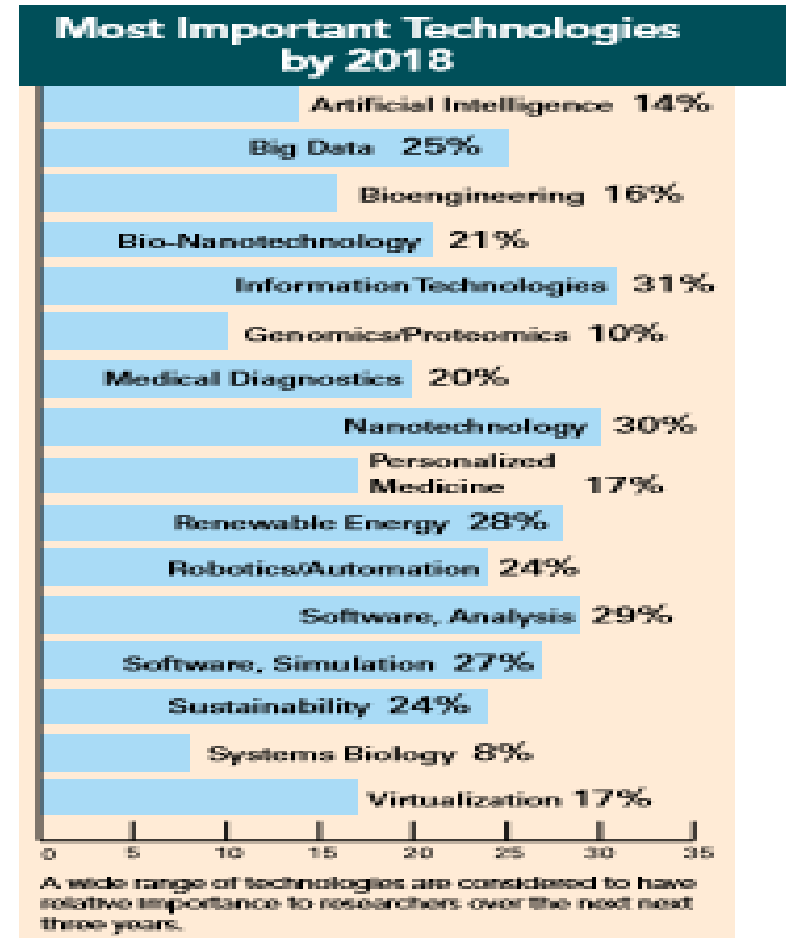
... es necesaria para el desarrollo tecnológico...

Porcentaje del I+D global por industria, 2016



Fuente: 2016 global R&D forecast

Crecimiento de I+D en nuevas tecnologías



... y el capital humano cualificado...

THE WORLD'S MOST IN DEMAND PROFESSIONS

Across the developed countries of the world, skilled professionals are in high demand. Software engineers are needed in 24 countries, nurses are needed in 18, while 11 countries report a shortage of accountants. Explore the chart below to see which occupations are most in demand across the world and discover which skills are needed.



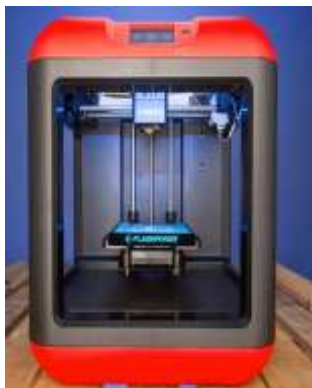
Fuente: Michael Page 2017



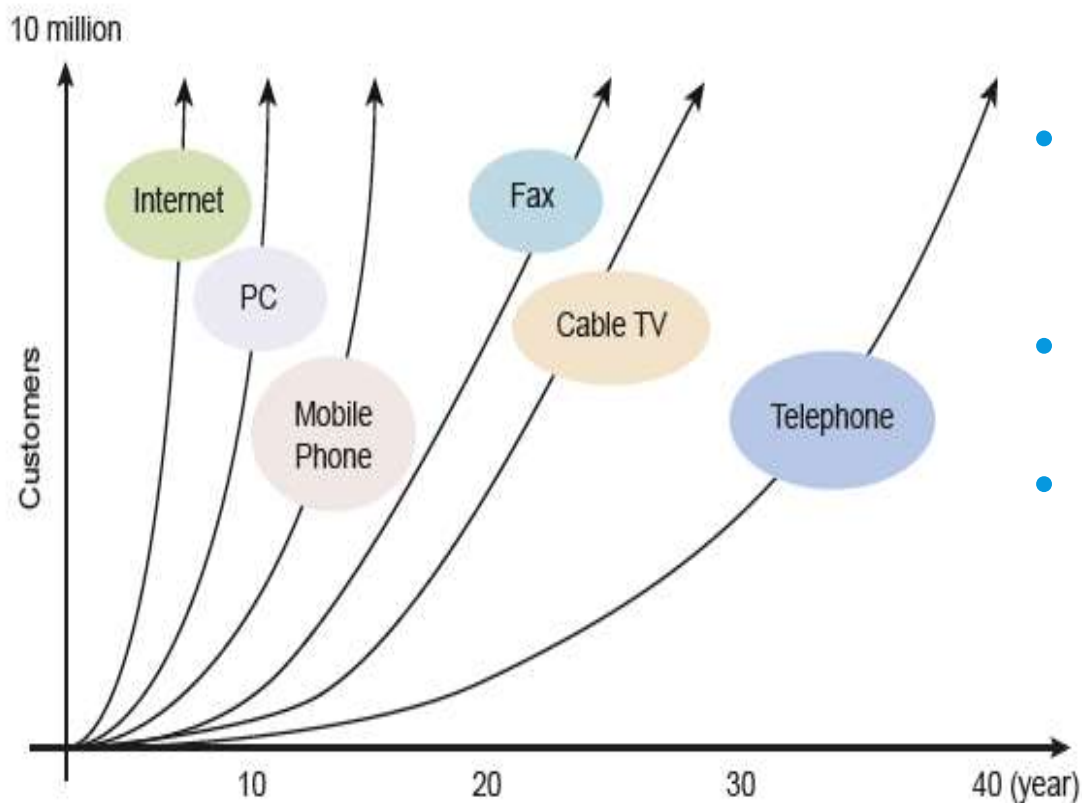
Over the next decade nearly
3.5 million
manufacturing jobs
will likely be needed and
2 million are
expected to go unfilled
due to the skill gap



Las dos megatendencias en la nueva política industrial: la industria 4.0 y la economía circular



Aceleración en los ciclo de vida de los productos



- Aceleración de la innovación tecnológica
- Ciclo de vida más cortos
- Mayor presión en la agregación de valor

Source: Yim, 2011.

Impacto de la industria 4.0 en el sector productivo



INNOVACIÓN

Las fábricas inteligentes son impulsores de la innovación, la digitalización permite nuevos modelos comerciales, productos y procesos



OPTIMIZACIÓN RECURSOS

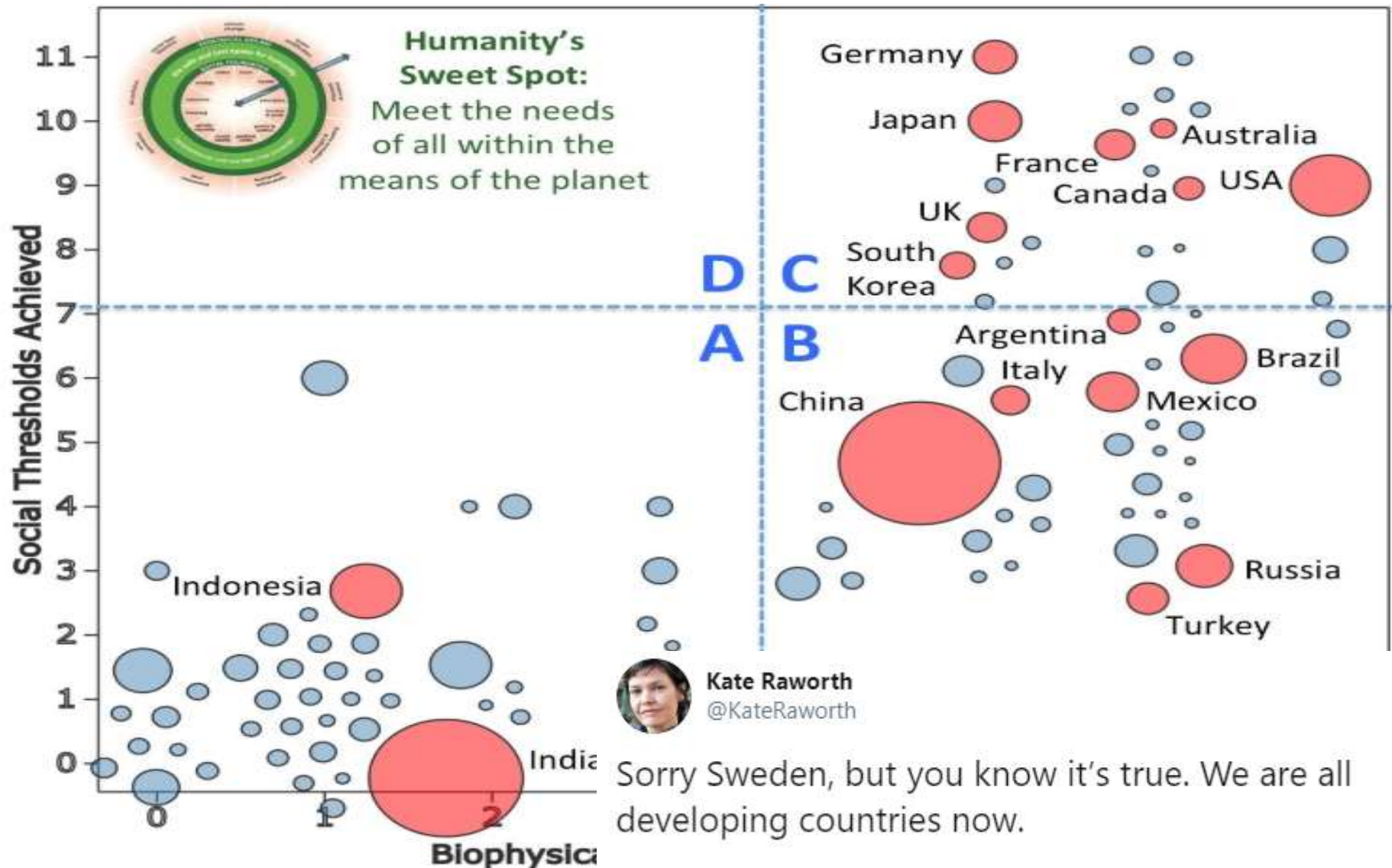
- Diseño y producción más rápido
- Sistema de mantenimiento preventivo
- Los procesos de compras son más rápidos
- Optimización recursos: menos desecho, consumo energético más eficiente



PERSONALIZACIÓN

Los productores están directamente vinculados a los consumidores, esto permite la producción individual y la personalización

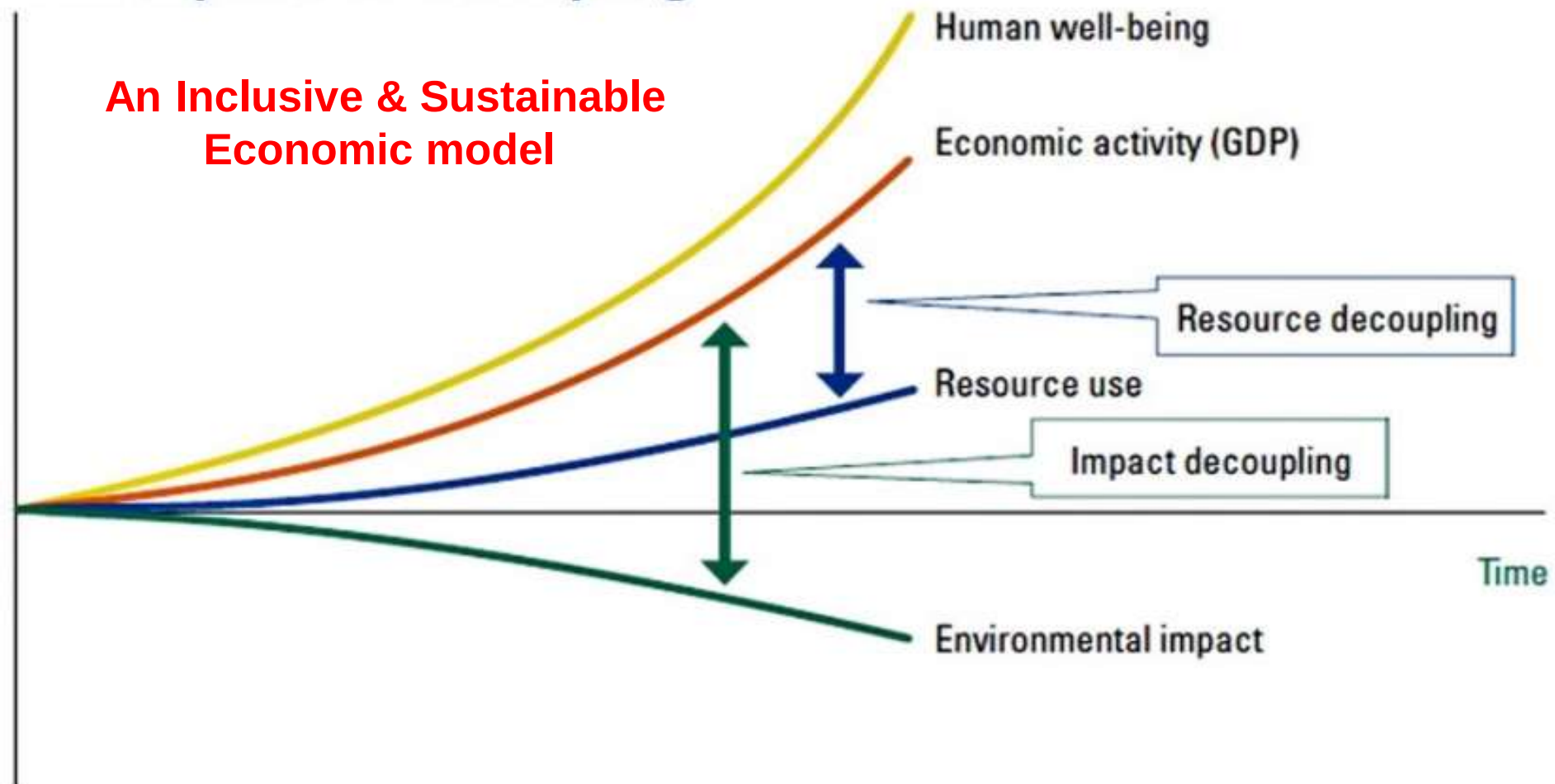
Un cambio de paradigma: Todos somos países en desarrollo



Crecimiento, recursos y el medio ambiente

Two aspects of 'decoupling'

**An Inclusive & Sustainable
Economic model**



La Economía Circular: Una mirada diferente a transformación productiva

ECONOMÍA LINEAL

Extraer



Fabricar



Usar



Residuo



ECONOMÍA DEL RECICLAJE

Extraer



Fabricar



Usar



Residuo

Reciclar



ECONOMÍA CIRCULAR

Extraer



Fabricar



Usar



Reutilizar

Retornar



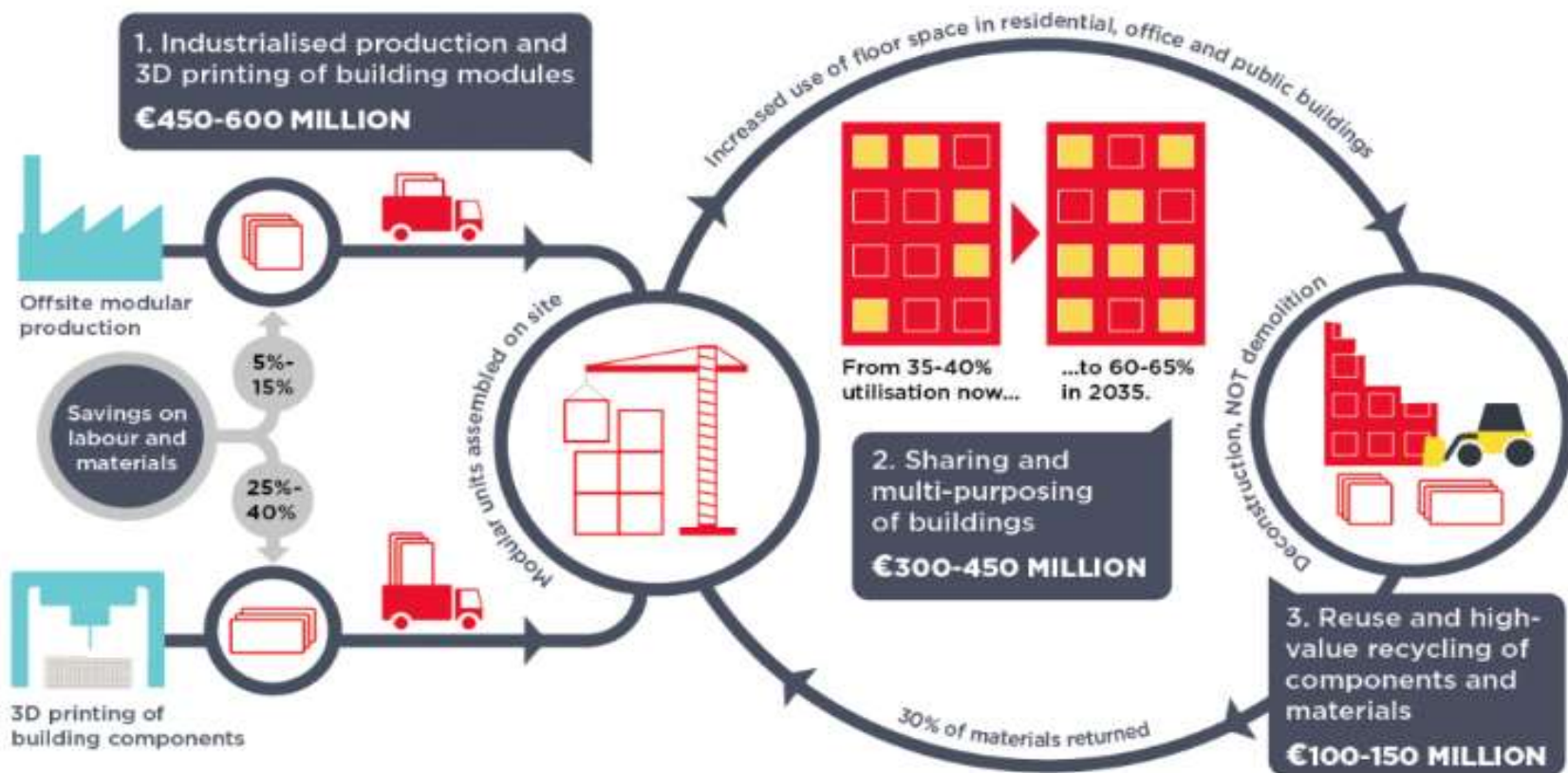
Reciclar



Reparar

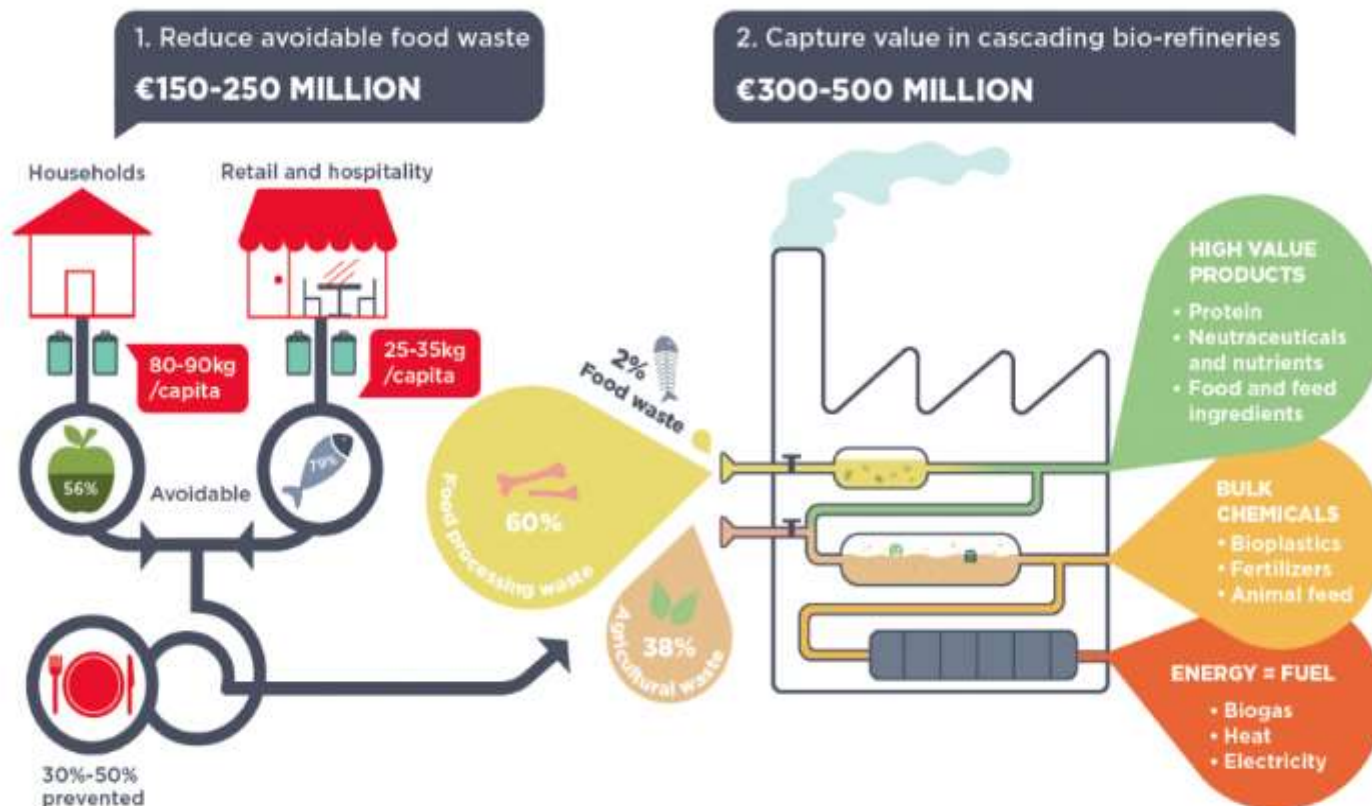


CONSTRUCTION & REAL ESTATE OPPORTUNITIES IN DENMARK



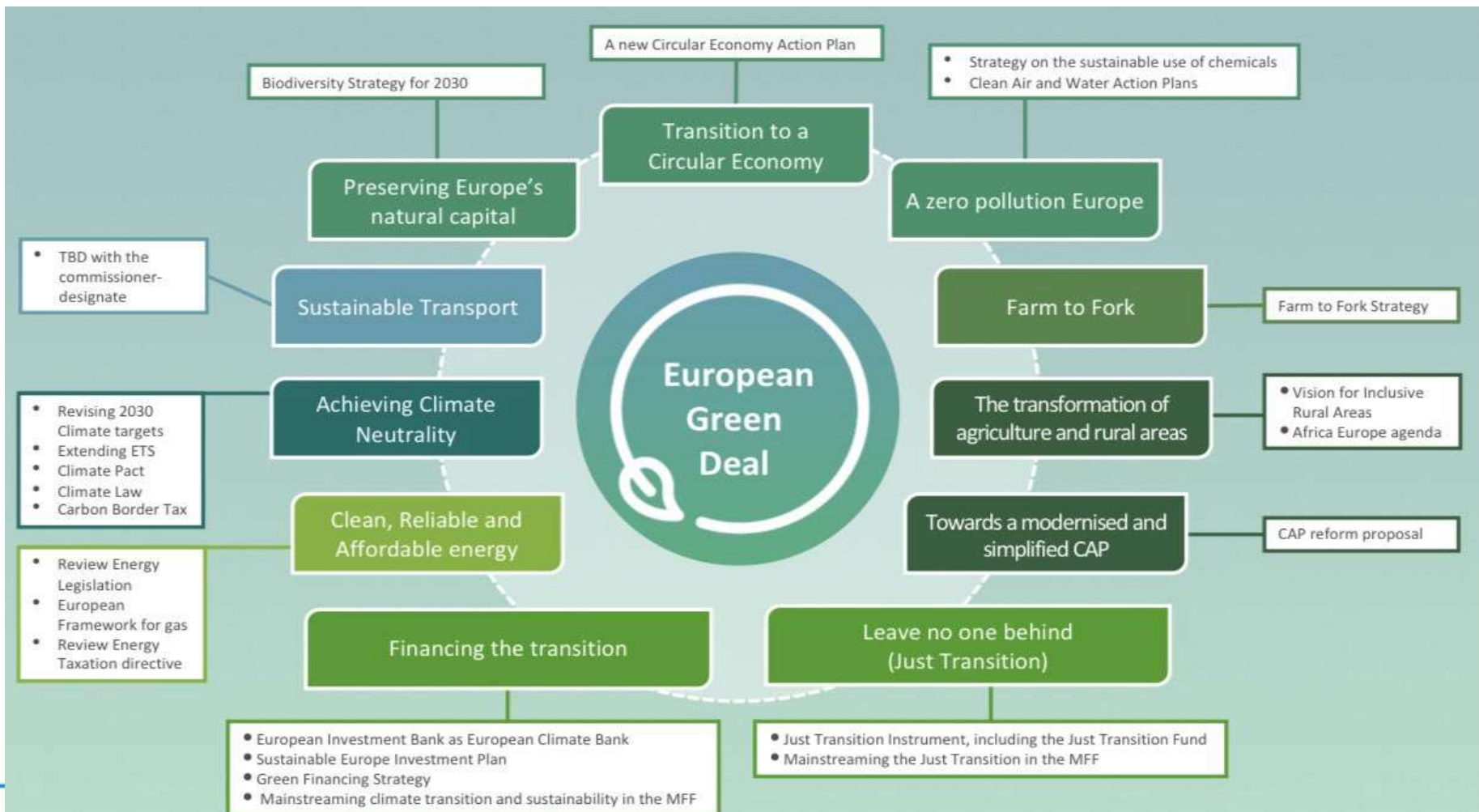
Ellen MacArthur Foundation, *Delivering the circular economy – a toolkit for policymakers* (2015). Analysis made by the Ellen MacArthur Foundation with analytical support from McKinsey & Company and NERA Economic Consulting.

FOOD & BEVERAGE OPPORTUNITIES IN DENMARK



Ellen MacArthur Foundation, *Delivering the circular economy – a toolkit for policymakers* (2015). Analysis made by the Ellen MacArthur Foundation with analytical support from McKinsey & Company and NERA Economic Consulting.

El Nuevo Factor Verde: Implicaciones para la Actividad Productiva



De la Granja a la Mesa: creación de un entorno alimentario saludable para consumidores

- Etiquetado de los alimentos para que los consumidores elijan dietas saludables y sostenibles
- Reducción de un 50 % de los residuos alimentarios per cápita en el comercio minorista y entre los consumidores en 2030
- Inversiones en I+D por valor de 10.000 millones de euros en el marco de Horizonte Europa para alimentación, bioeconomía, recursos naturales, agricultura, pesca, acuicultura y medio ambiente
- Promover la transición mundial, la UE colaborará con terceros países para apoyar el paso mundial hacia sistemas alimentarios sostenibles

Plan Economía Circular: Impacto legislativo y de acceso a mercado

- Producción e importación de productos sostenibles como norma
- Empoderamiento del consumidor (información en etiquetado y nuevos derechos);
- Nueva legislación para sustituir producto plástico y envasado de un solo uso;
- Nueva legislación para prevenir y reducir el desecho;
- Foco en sectores con alto potencial de circularidad:
 - Alimentos y Envases
 - Textil
 - Construcción
 - Plásticos
 - Electrónicos y baterías
 - Automotor



Muchas Gracias

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