FROM KETS INNOVATION TO KETS MANUFACTURING: A PATHWAY TO EUROPEAN COMPETITIVENESS

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Chief Executive Officer
LIST

KETs for Regional Growth,
Brussels, 6th May, 2015
INNOVATION IS THE KEY DRIVER FOR FUTURE REGIONAL ECONOMIC GROWTH
STRONG RELATIONSHIP BETWEEN GDP PER CAPITA AND GLOBAL COMPETITIVENESS INDEX

STRONG CORRELATION BETWEEN INNOVATION AND UNEMPLOYMENT

Index of Innovative Output

Unemployment Rate % (Eurostat)
US DEFINITION OF INNOVATION?

Innovation

Scientific Discovery → Engineering Invention → Innovation → Manufacturing...

A broader definition according to National Academies...

“Innovation commonly consists of being first to acquire new knowledge through leading edge research, being first to apply that knowledge to create sought-after products and services, often through world-class engineering; and being first to introduce those products and services into the marketplace through extraordinary entrepreneurship.”

Source: S. Kota « Revitalizing American Manufacturing ». White House Office of Science and Technology Policy
STRONG ASSOCIATION BETWEEN MANUFACTURING GROSS DOMESTIC PRODUCT (GDP) AND THE REAL (OVERALL) GDP OF A NATION.
Manufacturing is the backbone of globally competitive and innovation economies. Manufacturing makes a disproportionate contribution to the EU economy. Lose manufacturing, lose R&D.

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COLOCATING PRODUCTION & R&D INCREASES WITH THE INNOVATION LEVEL OF INDUSTRY

More extensive co-location of R&D and production

Minimal co-location of R&D and production

Innovation level of industry
R&D intensity (% of revenue)
ACCELERATED SHIFT OF MANUFACTURING COMPETITIVENESS TO ASIAN ECONOMIES
### Top 10 Manufacturers of Solar Panels/Cells 2001 to 2012 - Cell Production in MW

<table>
<thead>
<tr>
<th></th>
<th>Production 2001</th>
<th>Production 2004</th>
<th>Production 2009</th>
<th>Production 2012</th>
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<tbody>
<tr>
<td>1.</td>
<td>Sharp</td>
<td>75</td>
<td>1. First Solar</td>
<td>1100</td>
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<tr>
<td>2.</td>
<td>Kyocera</td>
<td>51</td>
<td>2. Suntech</td>
<td>704</td>
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<td>4.</td>
<td>BP solar</td>
<td>40</td>
<td>4. Q-Cells</td>
<td>571</td>
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<td>5.</td>
<td>Astropower</td>
<td>24</td>
<td>5. Yingli</td>
<td>525</td>
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<td>6.</td>
<td>Sanyo</td>
<td>20</td>
<td>6. JA Solar</td>
<td>520</td>
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<tr>
<td>7.</td>
<td>Isofoton</td>
<td>16</td>
<td>7. Kyocera</td>
<td>400</td>
</tr>
<tr>
<td>8.</td>
<td>RWE Solar</td>
<td>16</td>
<td>8. Trina Solar</td>
<td>399</td>
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### Sources:
- Photon International March 2010, Photon International March 2012, Euroobserver - Baromètre photovoltaïque avril 2012, Market Buzz 2013
EUROPEAN SHARE OF TOTAL WORLD INVESTMENT IN MANUFACTURING DECLINED FROM 40% IN 2005 TO 25% IN 2013 (37% REDUCTION)
KEY INNOVATION CHALLENGE TODAY IS CONVERTING KNOWLEDGE TO PRODUCTS AND SERVICES.

Europe challenge is to translate effectively scientific knowledge into consumer goods and services.
INNOVATION CHALLENGE RECOGNISED BY BOTH EUROPE AND US

Gap in Manufacturing Innovation

Knowledge

Government & Universities

Private Sector

GAP

Technology Readiness Level

1. Basic principles observed
2. Technology concept formulated
3. Experimental proof of concept
4. Technology validated in lab.
5. Technology validation in relevant environment
6. Demonstration in relevant environment
7. Demonstration in operational environment
8. System complete and qualified
9. Successful mission operations
10. Mass Production
NEW US 3B$ INITIATIVE TO CREATE RESEARCH TECHNOLOGY ORGANISATIONS (RTO’S)

Source: AMP Steering Committee
45 MANUFACTURING INSTITUTES TO RE-ESTABLISH THE U.S. AS A GLOBAL POWERHOUSE FOR MANUFACTURING INNOVATION

3.15 B$
A technology acquisition and development fund for the acquisition of appropriate technologies, the creation of a patent pool and the development of domestic manufacturing.
LUXEMBOURG MANUFACTURING INNOVATION INITIATIVE: BELVAL CAMPUS
SIGNIFICANT INCREASE IN EU KETS-RELATED INVESTMENT

KETs Signatures 2013 by Sector

- Automotive & Aircraft: 1.9 bn (43%)
- Chemicals: 665 m (15%)
- Electronics: 530 m (12%)
- Paper, Packaging & Textiles: 451 m (11%)
- Machinery & Equipment: 358 m (8%)
- Mechanical Engineering: 345 m (8%)
- Other: 125 m (3%)

Total KET lending per year

Source: EIB
“The U.S. and Asian research and Innovation efforts are often more strategically oriented. Science and Technology development in Asia and the United States are more focused on transformative and pervasive technologies [...].

In comparison, the EU is less focused on strategic areas and tends to scatter its efforts on a wider range of scientific fields and technologies, with the risk of dominating none”.
ABSENCE OF EC SUPPORT FOR TECHNOLOGICAL RESEARCH INFRASTRUCTURE IN THE REGIONS

Stimulate investment in manufacturing industry

Support to industrial pilot lines projects &

Support to RTO technology research infrastructures

First production
15 SYNCHROTON RADIATION FACILITIES ACROSS THE U.S

The US spends only 18% of their total federal budget on basic science, whereas 80% is dedicated to applied research.

45 manufacturing institutes are planned to be built with €3bn initial budget in order to support applied research (market oriented activities).
The EC spends more than 30% of the Horizon 2020 budget on basic science.

In addition, the EC earmarked €1.85 billion for RIs between 2007 and 2013 and, €2.5 billion between 2014 and 2020 in the frame of Horizon 2020.

NO dedicated EC support to technology & manufacturing research infrastructures.
MASSIVE INVESTMENT ARE NEEDED IN INNOVATION AND KETS TO GENERATE NEW PRODUCTS, STIMULATE MARKETS AND CREATE JOBS


Beginning of economic crisis

Europe 2020 Target would necessitate

15 millions new jobs in manufacturing by 2020
SUMMARY

1. Innovation is the key driver for regional economic growth

2. Manufacturing is crucial for a resilient regional economy

3. Regions and European Commission should significantly increase support for KETs technological research infrastructure and pilot lines to underpin and anchor future regional growth
THANK YOU FOR YOUR TIME

GABRIEL M. CREAN