

I ♥ KIMM

KIMM FOR CREATIVE ECONOMY

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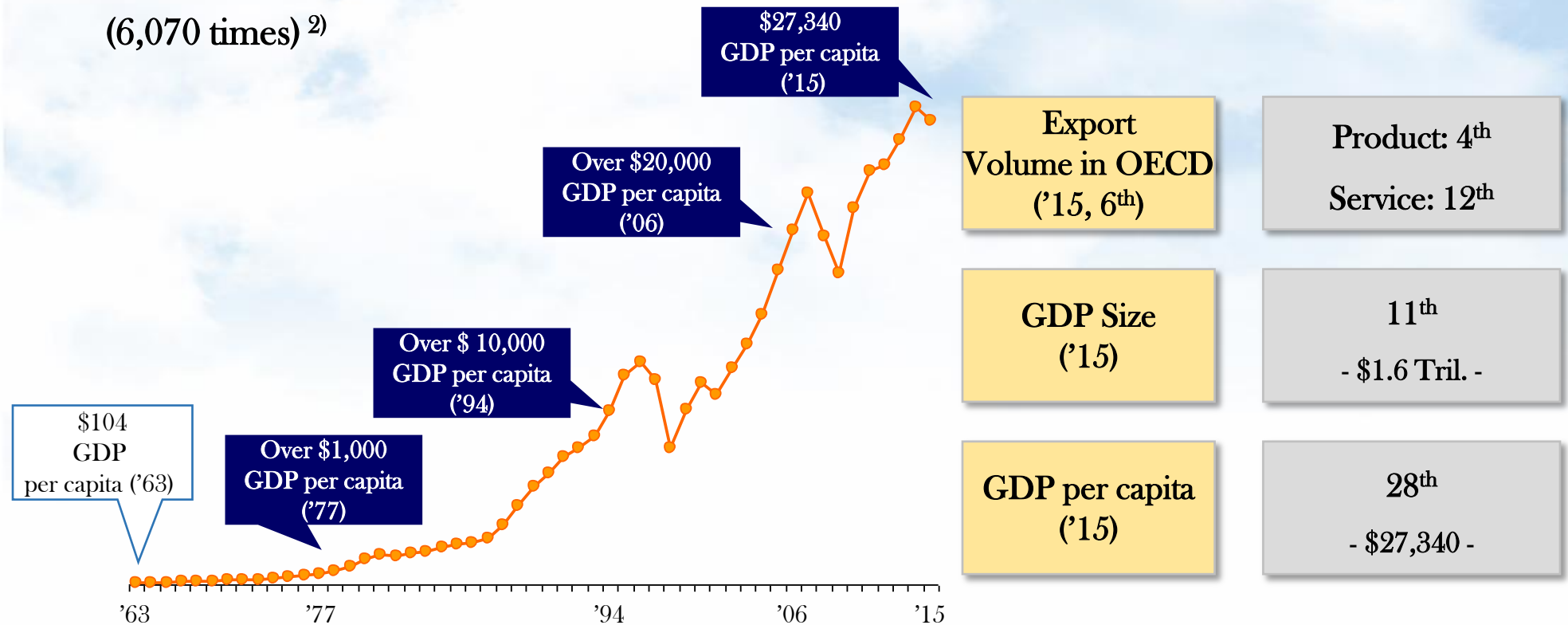
Aug 18, 2016

KIMM KOREA INSTITUTE OF
MACHINERY & MATERIALS

Economic Growth of Korea:

■ The Miracle of Han River:

- Export Volume¹⁾: 6th in the OECD countries in 2015
- Huge Growth of GDP ('63 - '15): 1.6 Trillion USD GDP (492 times) vs. National R&D Investment (6,070 times)²⁾

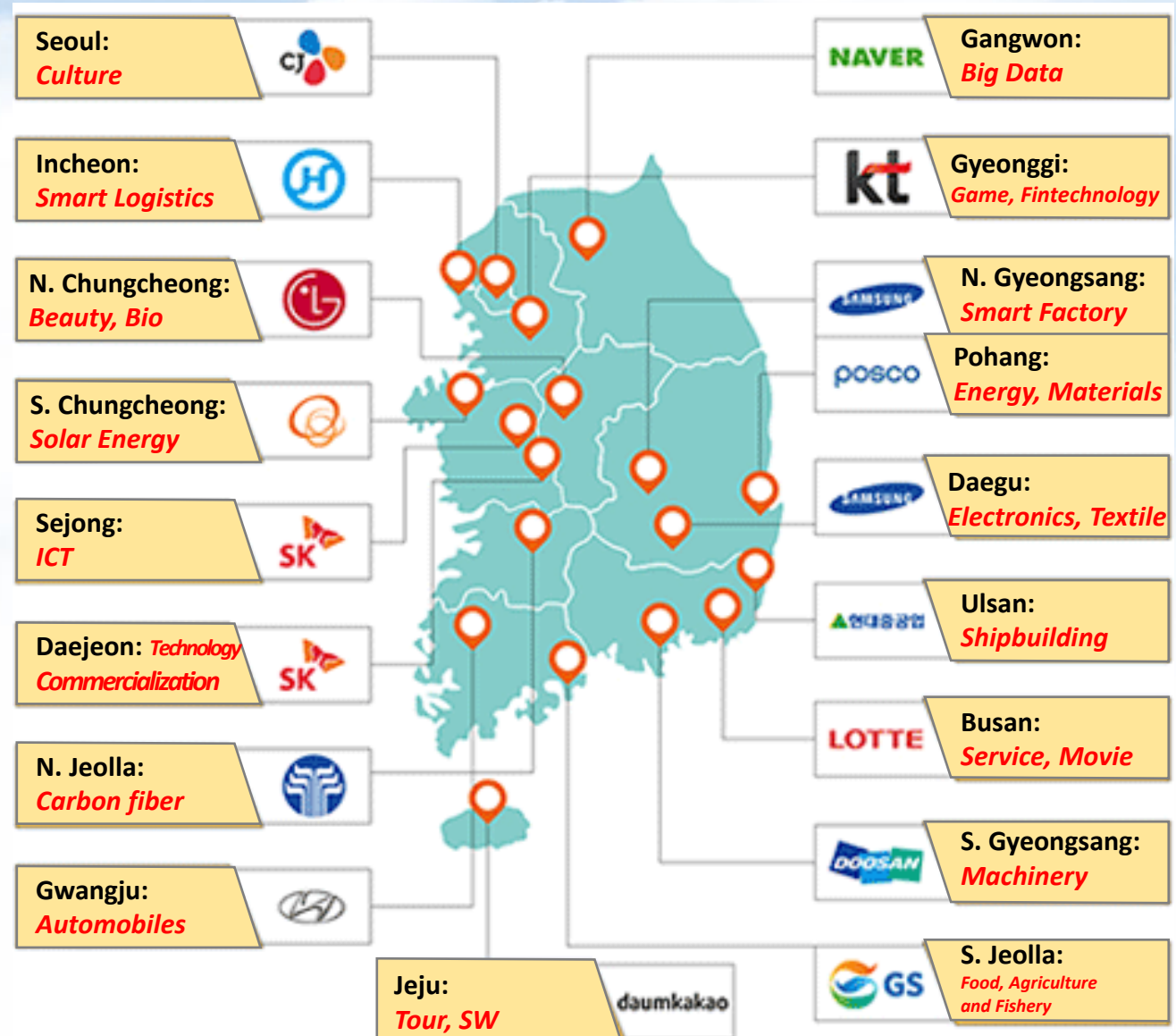


※ Data: Korea International Trade Association, World Trade Organization, Bank of Korea, National Science & Technology Information Service, International Monetary Fund

1) As of 2015, WTO, 2) National R&D Investment Ratio = National R&D Investment / GDP: 0.02% ('70) → 4.29% ('14)

Creative Economy Innovation Centers:

- Development Hub for Start-ups, SMEs, and Regional Innovation Ecosystem



Mission Change of KIMM:

Old Mission:

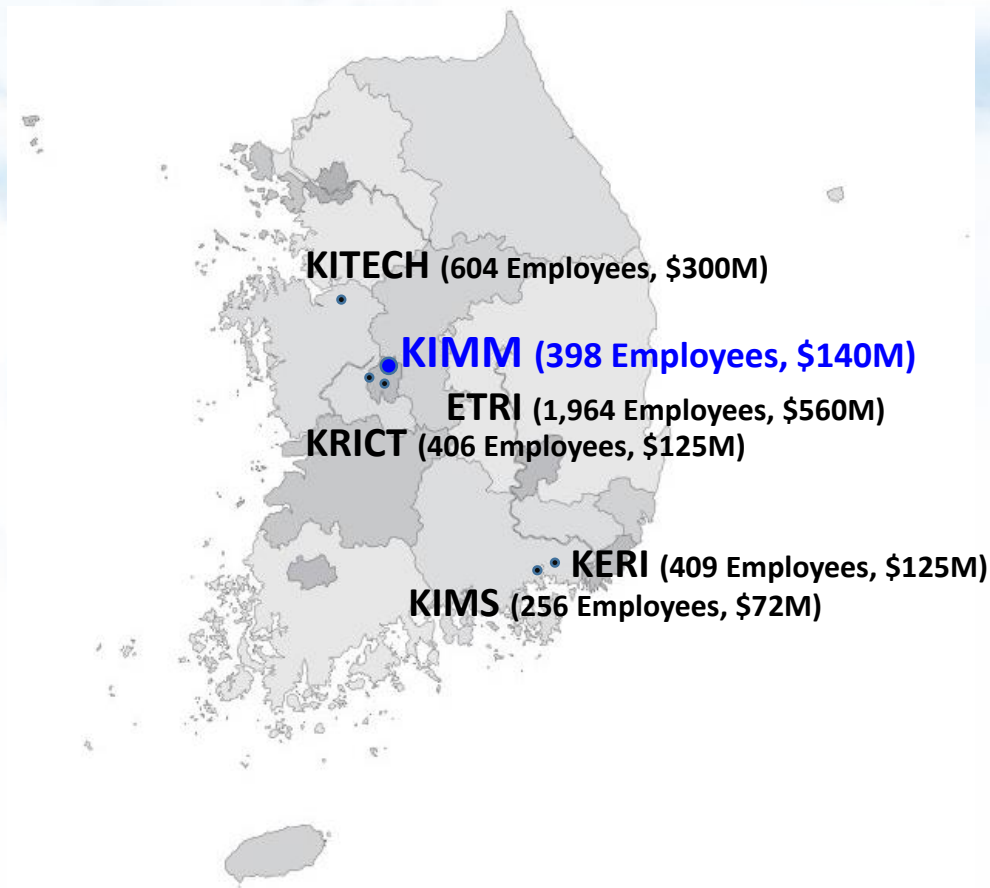
To contribute to economic growth of the nation by performing R&D on key technologies in machinery and materials, conducting reliability test evaluation, and commercializing the developed products and technologies

New Mission:

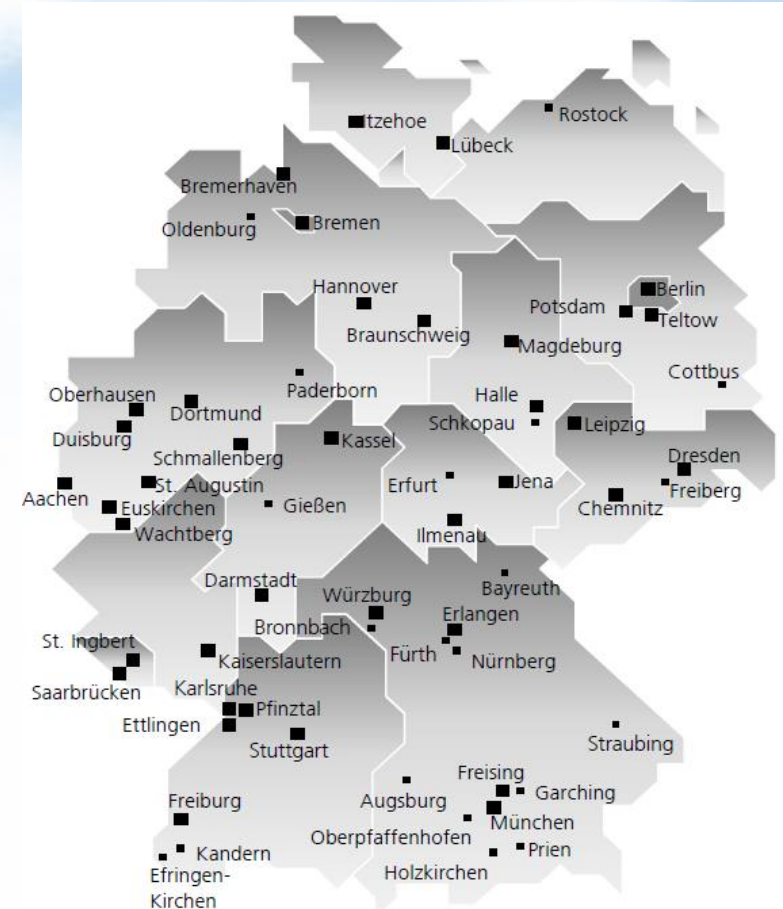
To become a global research institute in mechanical engineering by introducing a new governance system to foster knowledge, innovation, motivation, and marketability, resulting in improving the research productivity and capability

Fraunhofer Institutes:

- Korean Fraunhofer Institute designated in 2015:
- National Initiatives for promoting practical R&D
 - 6 Institutes

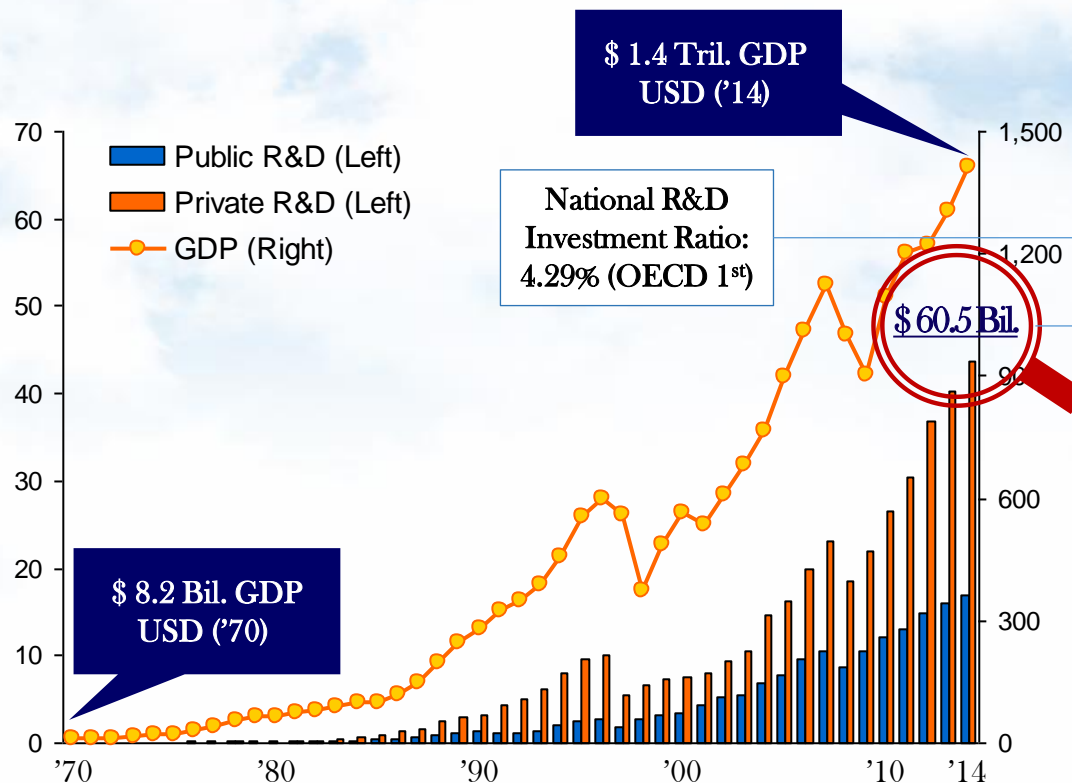


- The Fraunhofer-Gesellschaft in Germany:
- Europe's Largest Institute for Applied Research
 - 68 institutes and research units in Germany
 - 24,000 employees, € 2 billion (Partly public funded)



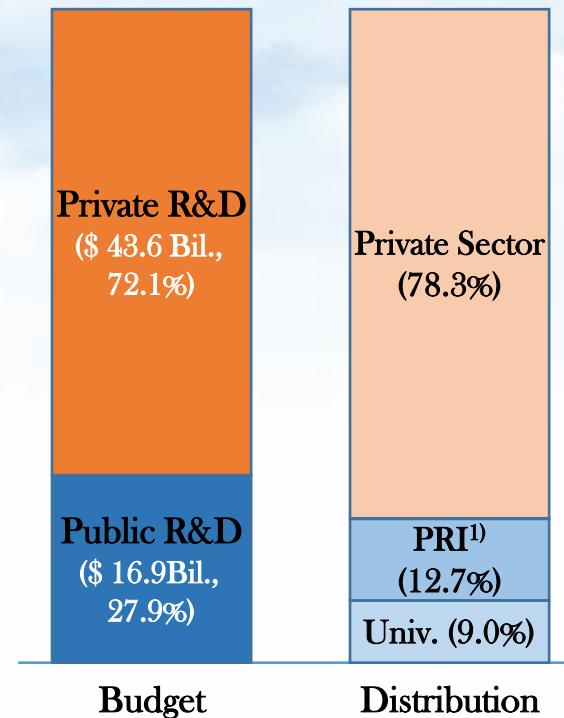
National R&D Investment:

- Economic Growth by Industrialization through R&Ds
- New Roles and Mission of the Public Research Institutes (PRI)



R&D Investment Portfolio

(\$ 60.5 Bil., '14)



※ National R&D project survey report (KISTEP, 2014), etc.

1) PRI: Public Research Institute (PRI), composed of GRI (Government Research Institute) 92% and NRI (National Research Institute) 8%

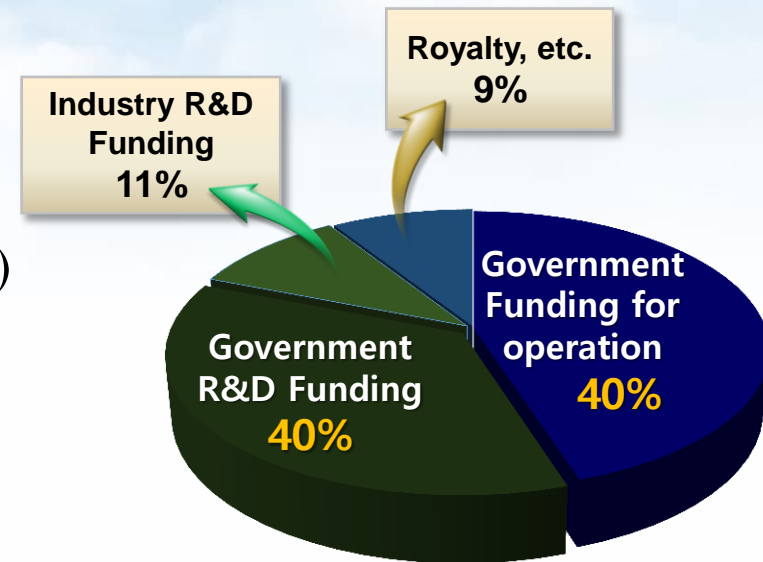
Overview of KIMM:

History:

- 1976, Founded as the Korea Test Institute of Machinery & Metals
- 1996, Spin-off: KARI (Aerospace)
- 1999, Spin-off: KRISO (Ship Building and Ocean Plant Engineering)
- 2007, Subsidiary: KIMS (Materials)

Personnel & Budget:

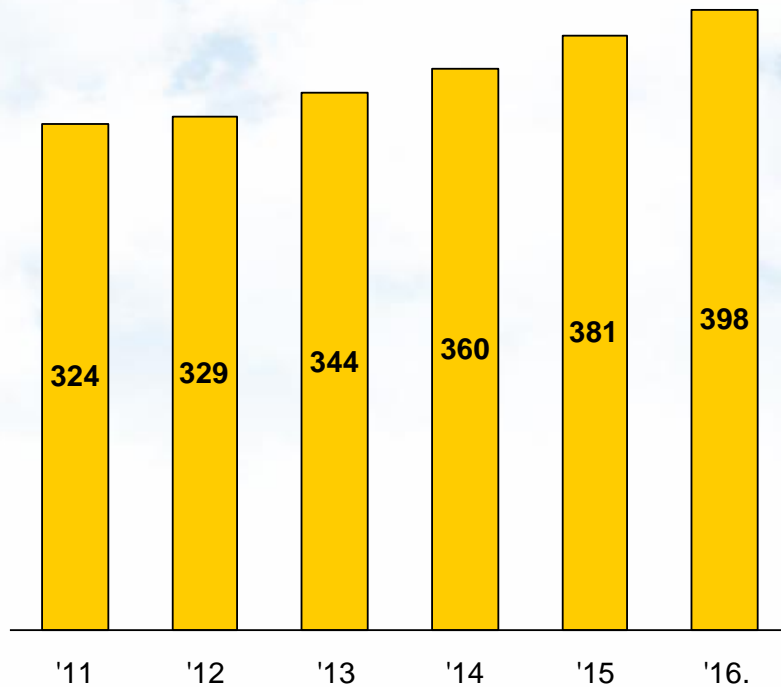
- Employee (FT): 398 (Ph.D: 290 (73%), MS: 59 (15%))
- Employee (PT): 230 (Ph.D: 42 (18%), MS: 77 (33%))
- Budget ('16): USD 140 M



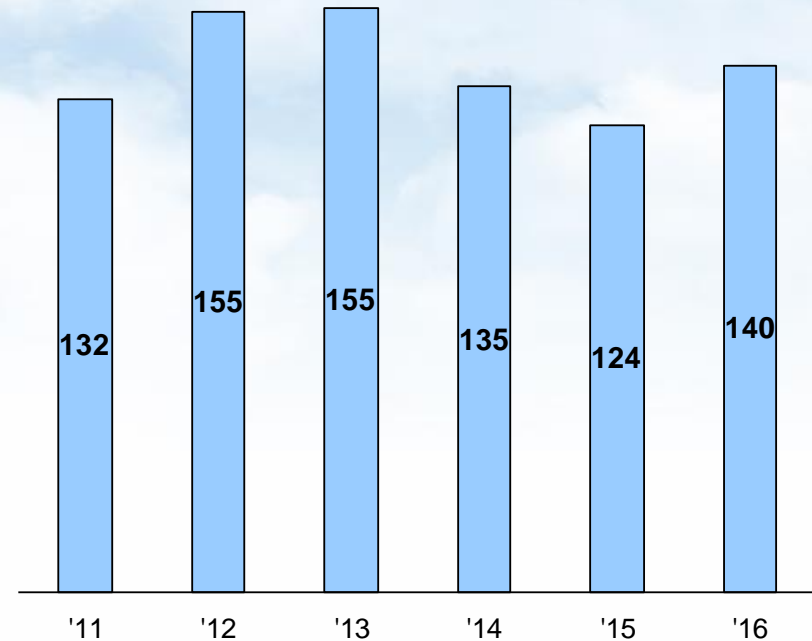
1) FT: Full Time

Recent Statistics of Personnel & Budget:

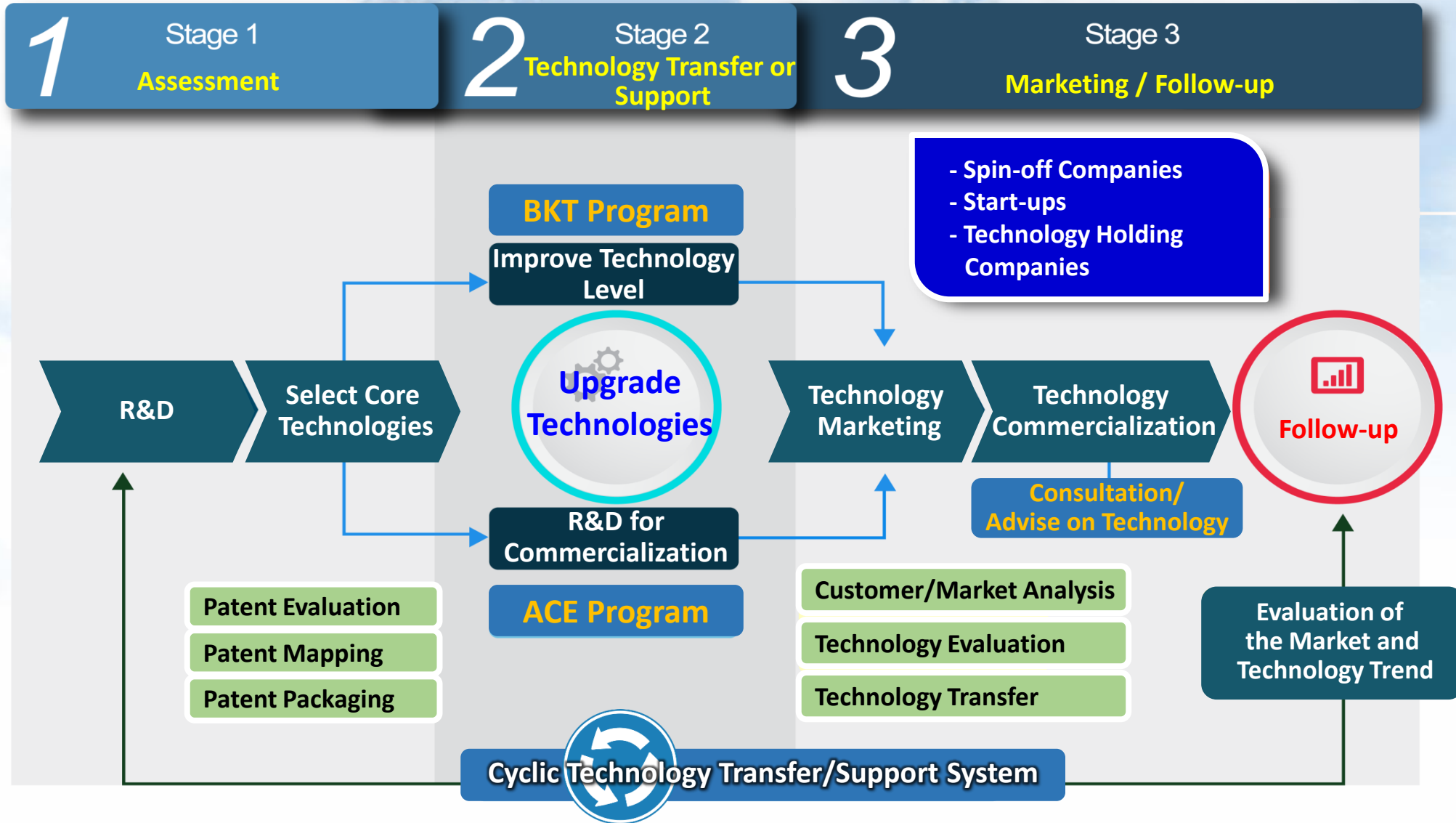
■ Full Time Employment Trend



■ Budget Trend (USD in Million)

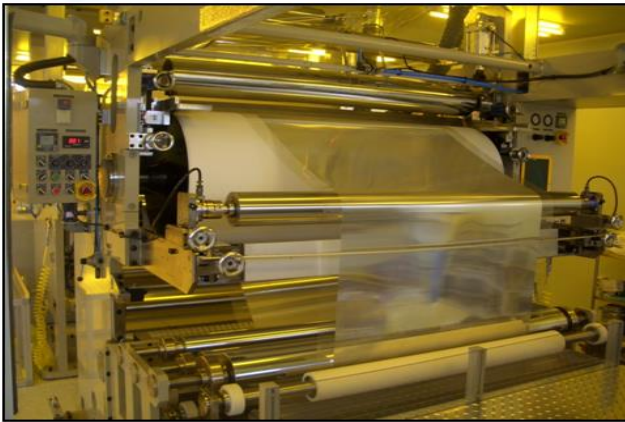


Overall Structure of Technology Transfer System:



Major Technology Transfer Case: JPE

- The 1st Successful Story of Technology Investment by PRI
- Established the large area micro-pattern roll and optical film manufacturing company in 2007 and sold out the investment shares to generate USD 2.4 M in 2014



Major Start-Ups: VNI Solution Inc.

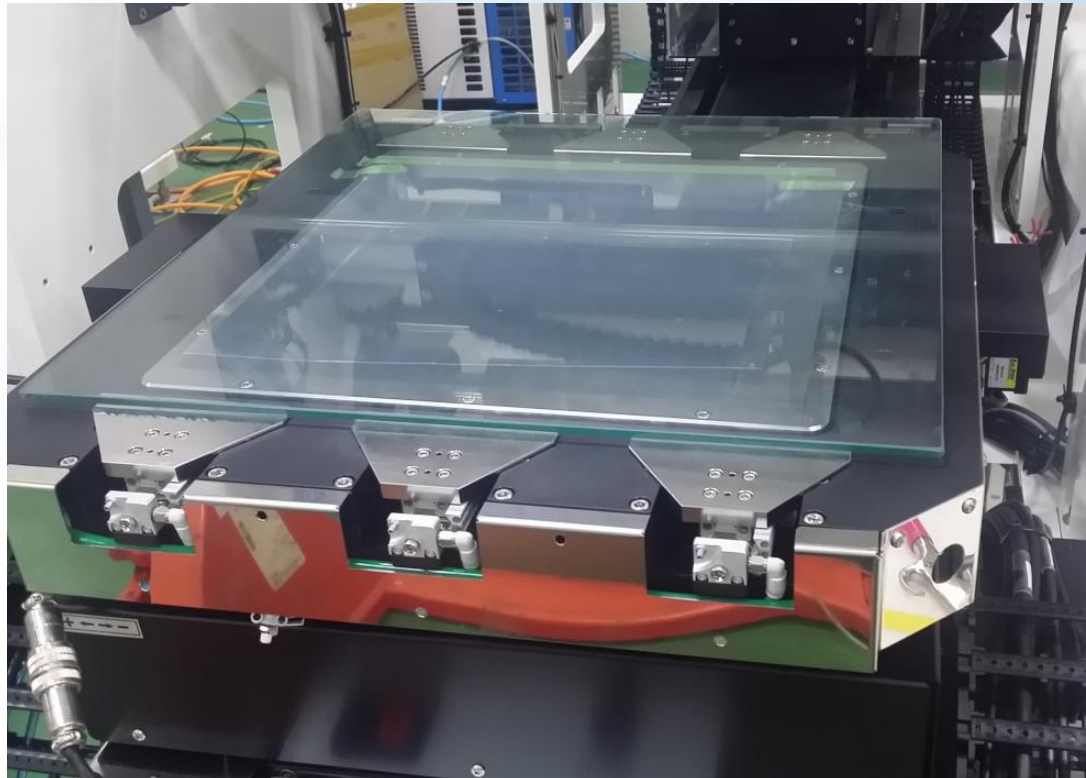
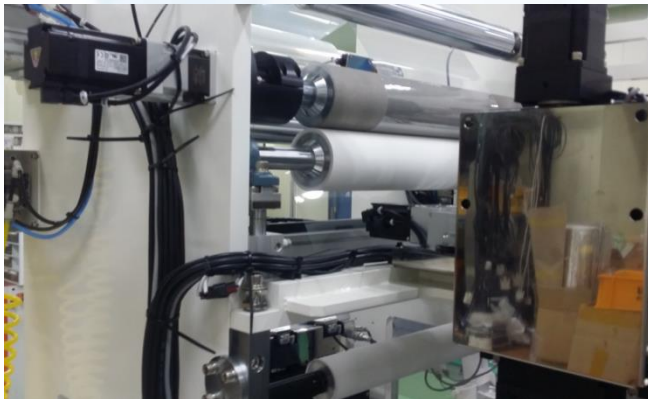
- Stage Technology driven by Piezoelectric Element: Flexible Wearable Nano Alignment, Flexible ALD



※ Acquired USD 2 M from Korea Science & Technology Holdings

Major Start-Ups: Flexcom Inc.

- Roll Transfer Technology using Thin Film Type Semiconductor Element:
Flexible Packaging Equipment utilizing Roll Transfer Technology



※ Acquired USD 0.5 M from Korea Science & Technology Holdings

Major Start-Ups: BlueSys Inc.

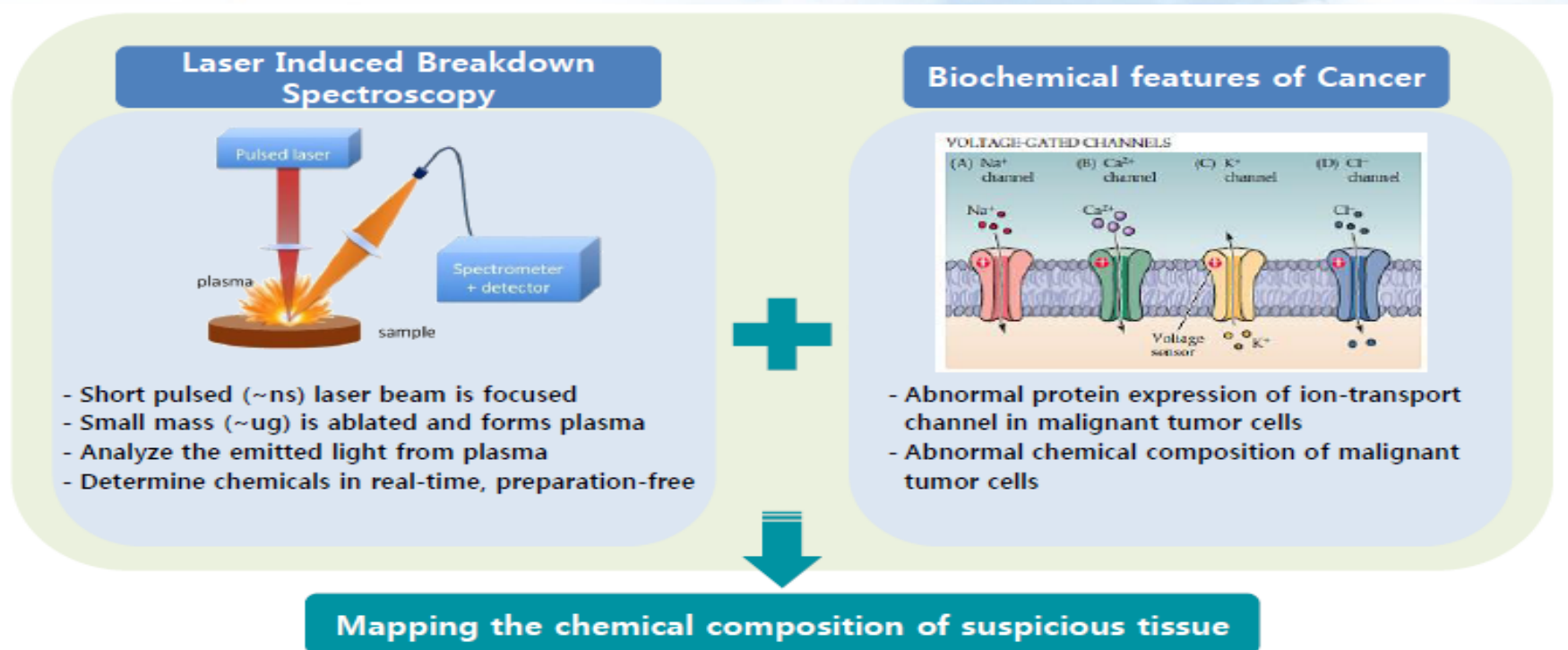
- Thermo-element Manufacturing Method and Property Evaluation:
Thermoelectric Module Measuring Equipment



※ Acquired USD 0.3 M from Korea Science & Technology Holdings

Major Start-Ups: Speclipse

- A Medical Device Company for Early Skin Cancer Detection: Real-Time Non-Invasive in Vivo Skin Cancer Diagnostics Solution based on Laser Spectroscopy and Statistical Algorithm
- Selected as a Dream Venture Star (USD 0.1 M) and Awarded for TIPS Program (USD 0.8 M)



Major Start-Ups: Speclipse

KOREAN
STARTUP
SUMMIT NYC



The 3rd Korean Startup NYC 2016 was held at Microsoft Technology Center in New York.....



SPECLIPSE, Inc. won the 1st prize at Korean Startup Summit NYC 2016!

Awarded \$120,000 worth of cloud service from Microsoft!

<https://kstartupsummitjune2016.splashthat.com/>

Major Technology Support Case: JinYoung HNS Co.



<Improved Impeller>

- Due to Technology Support for Modeling and Simulation by KIMM, Sales Volume of the Impeller with Improved Quality increased by USD 2 M.



<blood sample device>

- Technology Support and successful Commercialization of 'Non-invasive Laser Blood Sampling Device for Diabetic' through KIMM's ACE program help in achieving CE Mark and the Export of USD 2.7 M.
(Royalty USD 46 K, Running Royalty 3% of Sales)

Major R&D Accomplishments: Urban Maglev

World's 2nd Commercialization of the Urban Maglev:

- Commercial Service at the Incheon Int'l Airport (6.1km) on February 3, 2016
- MoU with Gordon Atlantic Co. for the Service in the State of Leningrad in Russia



- Eco-friendliness with Low Noise, Low Vibration and No Pollutants
- No Risk of Derailment or Electromagnetic Hazard
- Low Maintenance and Operation Cost



Major R&D Accomplishments: Verification of Maglev

Verification of Maglev in May, 2014:

- KIMM's Maglev Performance Verification Team approved the first Maglev train manufactured by the Hyundai Rotem Company by validating 52 test items



A Photo of the Test Completion

인천국제공항 자기부상열차 성능인증

7월 중순 개통을 앞두고 영업운전 준비 완료

박남수 기자 wpcpark@koit.co.kr

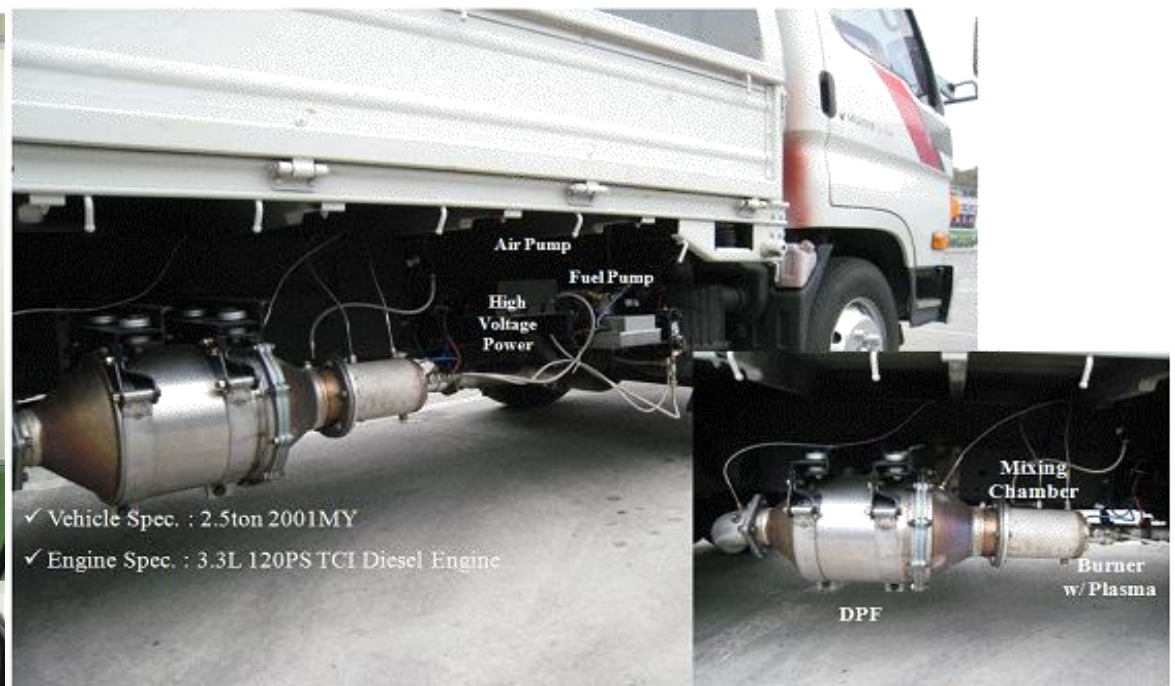


한국기계연구원 임용택 원장(좌)이 현대로템(주) 한규환 부회장에게 성능인증서를 수여하고 있다.

- Delivery of the Certification to Hyundai Rotem Company by KIMM's president

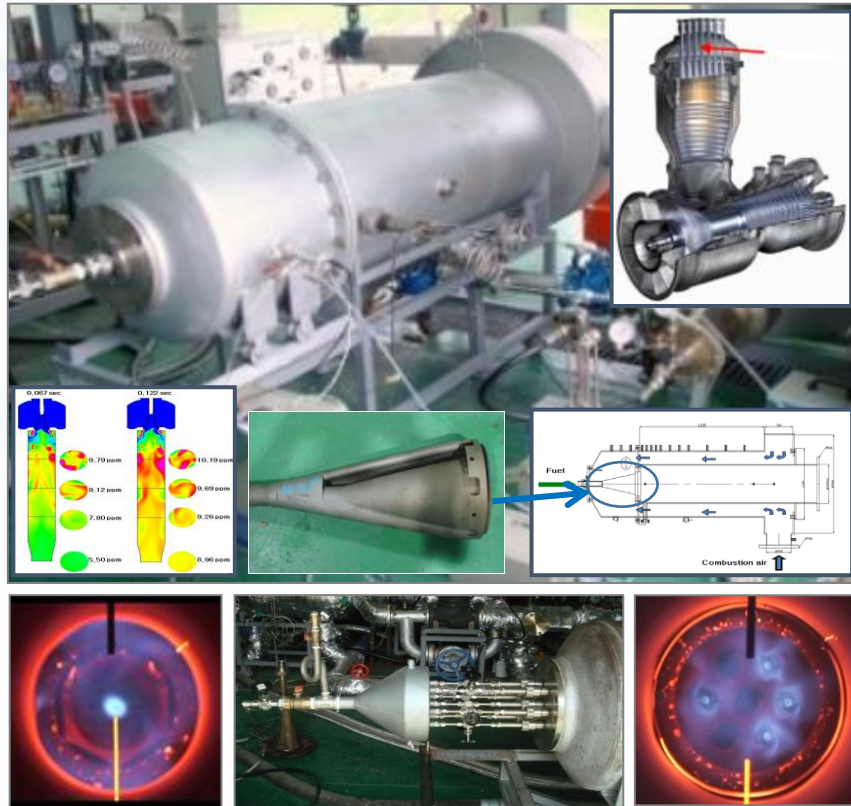
Major Accomplishments: Plasma Technology

- Low Pressure Plasma Burner Set-up for Semi-Conductor Production Line of Samsung Electronics and SK Hynics
 - Increase of Vacuum Pump Life from a Few Weeks to 2 Years
 - Reduction of Micro-particulate in the Production Line
- DPF or SCR applied to Automobiles, Ships and Power Plant
 - Reduction of NO_x and PM (Particulate Matters)
 - Compact in Size & Low Cost



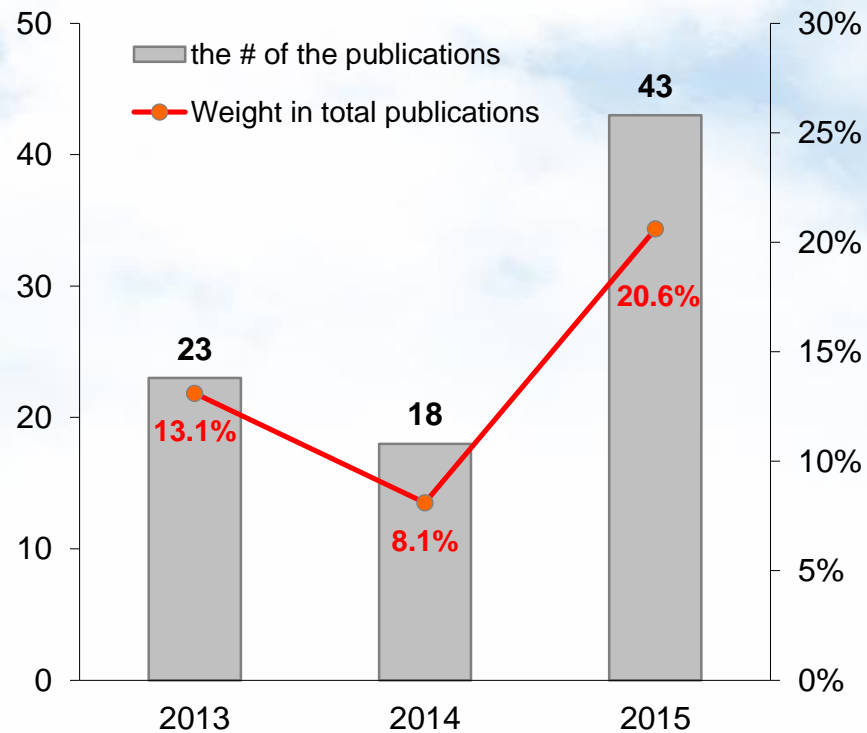
Major Accomplishments: Low NO_x GT Combustor

- Developed Low NO_x Combustor for Industrial Gas Turbine of 80 MWe
- Supplied four Sets of Combustors to Namdong Power Plants (Sung-il Turbine Co.)
- On-site Performance Test to confirm 30% NO_x Reduction



International Research Collaborations:

- Increase in the Joint Publications with International Institutes:
Increase in the Number of Joint Publications approximately 90% ('13~'15)



※Data: Thomson Reuters

MoU with IPT at Aachen:

- Fraunhofer IPT (Fraunhofer Institute for Production Technology) at the Technical University of Aachen:
 - ✓ *Consistency and Continuity*
 - ✓ *Sustainability*
 - ✓ *Close Collaboration with the University*



Mou with IPT



Laboratory at IPT

Appreciation:

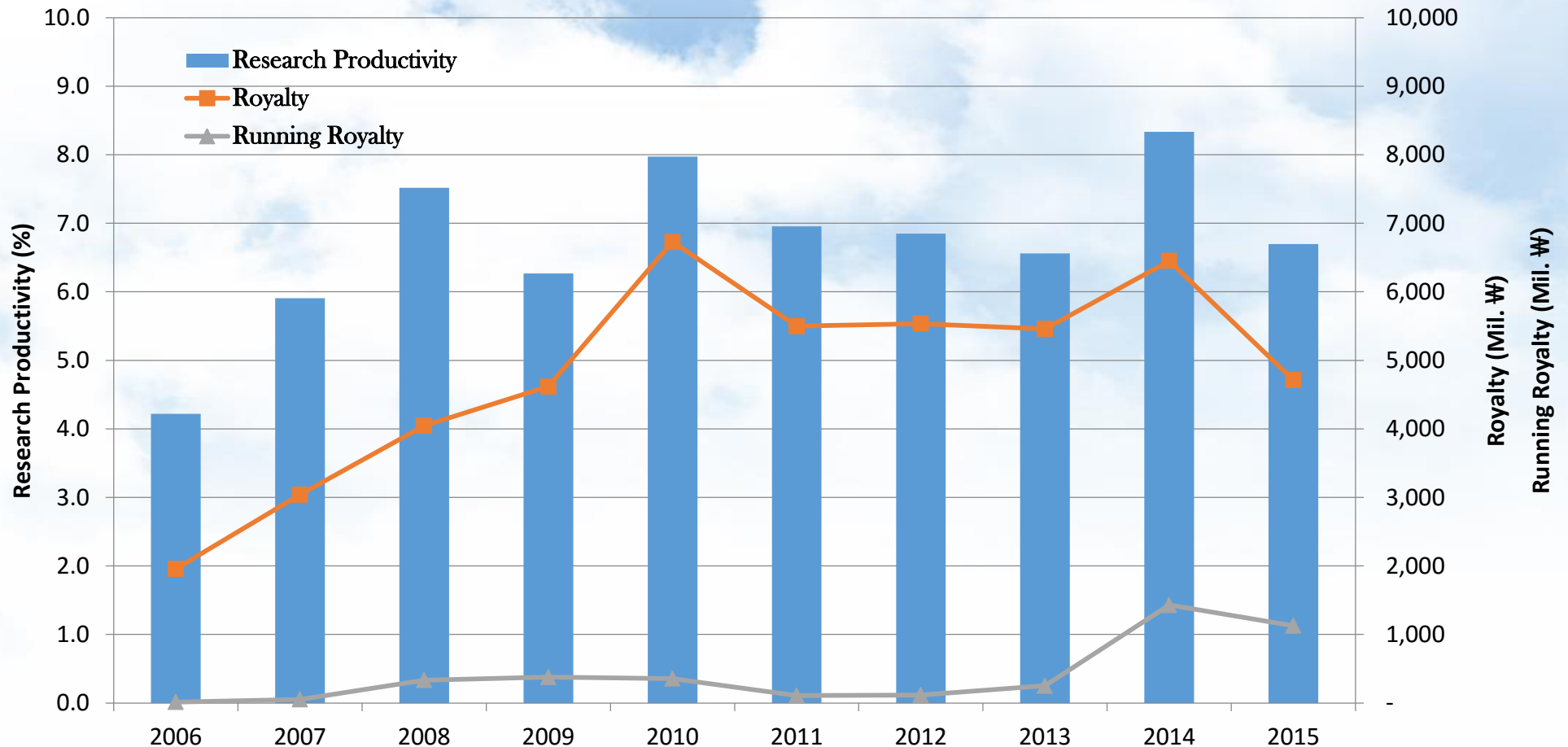


- Dr. Hellmut Schmücker, First Technical Advisor to the President of KIMM

Major Issues for Globalization:

- ✓ *Demographic Change*
- ✓ *Cultural Awareness*
- ✓ *Scientific Compatibility and Strength*
- ✓ *Accountability*
- ✓ *Sustainability*
- ✓ *Intellectual Property*
- ✓ *Diversity*
- ✓ *Etc.*

Recent Research Productivities of KIMM:



- During 2014~2015, Research Productivity 7.6% on average
- Royalty and Running Royalty per Research Scientist of 40.4 and 9 million KW, respectively

Lesson from the German Church:



*Kaiser Wilhelm Gedächtnis Kirche@google image

Knowledge
Innovation
Motivation
Marketability



Creative
Economy

- Build up new R&D Culture through Sustainable S&T Policy

An aerial photograph of the KIMM campus, showing various buildings, green spaces, and surrounding forests. A large, bold, blue 3D-style text 'THANK YOU!' is centered over the image.

THANK YOU!

<http://www.kimm.re.kr>