Brussels, 18 December 2019

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LIMITE

ERAC-SFIC

WORKING PAPER

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WORKING DOCUMENT

From: SFIC Secretariat
To: ERAC (SFIC)
Subject: 70 Years of Fraunhofer : 70 Years of Future # WHATSNEXT

Delegations will find attached the PowerPoint presentation concerning the item 6 of the SFIC plenary agenda of 18 December 2019.
STRATEGIC FORUM FOR INTERNATIONAL S&T COOPERATION

FRAUNHOFER-GESELLSCHAFT
THOMAS DICKERT, HEAD INTERNATIONAL RESEARCH PROGRAMS AND NETWORKS

70 YEARS OF FRAUNHOFER
70 YEARS OF FUTURE
#WHATSNEXT
EARTO
The European Association of Research & Technology Organisations

EARTO Motto: Impact Delivered! | EARTO Vision: Technology for a Better World

*logos of EARTO Board members
Understanding RTOs’ activities

• RTOs’ core public mission is to harness science & technology in the service of innovation, to improve quality of life and build socio-economic competitiveness.

• RTOs have multidisciplinary expertise and skills, and they closely collaborate with universities and industry (large and small).

• RTOs house various technology infrastructures open to all stakeholders to foster technology uptake.
RIN - RTOs International Network

New network initiated in March 2019 by EARTO to:

- Create a platform for joint opportunities for RTOs: joint actions on common challenges and interests, promotion of the RTO model to international and national policymakers
- Create a group of RTOs’ CEOs willing to share their national experiences and best practices
- Expand collaboration between RTOs worldwide in areas of common interest
- Develop a common narrative on RTOs at global scale
- Direct the creation of specialised communities of practice in key fields
- Potential to provide preferred access to fellow members’ facilities

Supported by EARTO Corresponding Members:

National Research Council Canada
Conseil national de recherches Canada
ITRI
Industrial Technology Research Institute
NSTDA
ipt
Drivers & Motivations: Why do RTOs engage in Internationalisation?
- Access to foreign knowledge base and partners
- Access to new markets, clients and funding
- Strengthening the domestic consumer base
- Access to international public funding programmes

Barriers against internationalisation:
- Funding dependence & mission from national governments
- Lack of financial, human resources and skills
- Legal, administrative and fiscal barriers
- Level of competition

Strategies: How do RTOs internationalise?
1. Identifying RTOs’ capabilities
2. Discovering new markets
3. Market consolidation
EARTO Members in H2020 (eCorda Oct. 2019)

- **EARTO members** represent 1% of the beneficiaries, but receive 8% of the available funding.
- Industry participation increases to 32% when EARTO members are involved in the project (from 26% when they are not).
- EARTO members coordinate 32% of the projects in which they participate.
- EARTO members participate in large collaborative projects with on average €5bn EU contribution and 14 partners per project.
- 63% of the funding spent in Pillar II (Industrial Leadership) given to projects with EARTO members.
- 51% of the funding spent in Pillar III (Societal Challenges) given to projects with EARTO members.
## EARTO Members in INCO (eCorda Oct. 2019)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Number of INCO projects with EARTO members</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Israel</td>
<td>299</td>
</tr>
<tr>
<td>2</td>
<td>Turkey</td>
<td>254</td>
</tr>
<tr>
<td>3</td>
<td>Serbia</td>
<td>117</td>
</tr>
<tr>
<td>4</td>
<td>Ukraine</td>
<td>62</td>
</tr>
<tr>
<td>5</td>
<td>South Africa</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>Argentina</td>
<td>24</td>
</tr>
<tr>
<td>7</td>
<td>Former Yugoslav Republic of Macedonia (FYROM)</td>
<td>24</td>
</tr>
<tr>
<td>8</td>
<td>Moldova (Republic of)</td>
<td>24</td>
</tr>
<tr>
<td>9</td>
<td>Tunisia</td>
<td>18</td>
</tr>
<tr>
<td>10</td>
<td>Egypt</td>
<td>18</td>
</tr>
<tr>
<td>11</td>
<td>Belarus</td>
<td>18</td>
</tr>
<tr>
<td>12</td>
<td>Kenya</td>
<td>17</td>
</tr>
<tr>
<td>13</td>
<td>Albania</td>
<td>15</td>
</tr>
<tr>
<td>14</td>
<td>Georgia</td>
<td>15</td>
</tr>
<tr>
<td>15</td>
<td>Chile</td>
<td>14</td>
</tr>
</tbody>
</table>

- **INCO projects with EARTO members**: $31\%$
- **INCO projects without EARTO members**: $69\%$
Fraunhofer International

- 8 subsidiaries
- Strategic cooperations worldwide
- Representative Offices and Senior Advisors worldwide provide access to local markets
International project volumes 2018

International project volumes – TOP 20 in €m

<table>
<thead>
<tr>
<th>Country</th>
<th>Project Volumes (€m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>26.6</td>
</tr>
<tr>
<td>Switzerland</td>
<td>25.0</td>
</tr>
<tr>
<td>Austria</td>
<td>21.5</td>
</tr>
<tr>
<td>China</td>
<td>19.2</td>
</tr>
<tr>
<td>Japan</td>
<td>17.3</td>
</tr>
<tr>
<td>Netherlands</td>
<td>10.9</td>
</tr>
<tr>
<td>UK</td>
<td>9.9</td>
</tr>
<tr>
<td>Belgium</td>
<td>7.3</td>
</tr>
<tr>
<td>France</td>
<td>6.9</td>
</tr>
<tr>
<td>South Korea</td>
<td>6.8</td>
</tr>
<tr>
<td>Denmark</td>
<td>5.0</td>
</tr>
<tr>
<td>Sweden</td>
<td>4.9</td>
</tr>
<tr>
<td>Italy</td>
<td>4.8</td>
</tr>
<tr>
<td>Kuwait</td>
<td>3.8</td>
</tr>
<tr>
<td>India</td>
<td>2.8</td>
</tr>
<tr>
<td>Spain</td>
<td>2.5</td>
</tr>
<tr>
<td>Norway</td>
<td>2.4</td>
</tr>
<tr>
<td>Poland</td>
<td>2.3</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>2.1</td>
</tr>
<tr>
<td>Israel</td>
<td>2.0</td>
</tr>
</tbody>
</table>
International project volumes by regions

in €m

Share of total project volumina in 2018: 19.7%

- **Total**
  - 2014: 249
  - 2015: 264
  - 2016: 275
  - 2017: 279
  - 2018: 293

- **Europe**
  - 2014: 88
  - 2015: 95
  - 2016: 97
  - 2017: 98
  - 2018: 114

- **Asia**
  - 2014: 30
  - 2015: 40
  - 2016: 44
  - 2017: 52
  - 2018: 57

- **North and South America**
  - 2014: 21
  - 2015: 20
  - 2016: 20
  - 2017: 20
  - 2018: 16

**Project volumina of foreign affiliates in 2018: 30.9**

Thereof:
- Fh USA: 14.1
- Fh Sweden: 4.2
- Fh Austria: 3.9
- Fh UK: 3.3
- Fh Portugal: 1.9
- Fh Chile: 1.9
- Fh Italia: 1.1
- Fh Singapore: 0.2

Other countries
- 2014: 1.6
- 2015: 1.5
- 2016: 0.9
- 2017: 0.9

Total growth:
- Europe: +17%
- Asia: +9%
- North and South America: -13%

Additional information:

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Scientific collaboration with excellent partners: ICON Projects 2008-2019

4 projects: University of Michigan, USA
Fraunhofer IFAM-DD, ICT, ILT & UMSICHT
Alternative Energy Technologies for Transportation 2009-2011

University of Southampton, UK
Fraunhofer IAS & FOKUS
Collective Web Intelligence 2012-2015

Cambridge University, UK
Fraunhofer ITWM
Financial Mathematics 2008-2011

Leiden University, Netherlands
Fraunhofer ISC & IME
Bio-Sensing 2018-2021

ETH-Bereich Empa, Switzerland
Fraunhofer ISE
Solid State Battery 2019-2021

3 projects:
Hebrew University, Israel
Fraunhofer IAP & IGB
Drug Delivery 2012-2016

CEA-LETI, CEA-LITEN, France
Fraunhofer IKTS
Additive Ceramic Manufacturing 2018-2021

Korea Institute of Materials Science, Republic Korea
Fraunhofer IKT
Multifunctional Hybrids 2008-2011

Chinese Academy of Sciences, China
Fraunhofer IPB & LBF
Acoustic Metamaterials 2015-2018

Lawrence Berkeley National Laboratory, USA
Fraunhofer ISE
Optical and Thermal Characterization of Building Envelopes 2018-2021

Johns Hopkins University, USA
Fraunhofer IIS, IPA & IGD
Interventional Medicine 2008-2010

AIST, Japan
Fraunhofer ISE
Optical and Thermal Characterization of Building Envelopes 2018-2021

Griffith University, Australia
Fraunhofer IWT
Anti-Infective Research 2017-2020

Monash University, Australia
Fraunhofer ISE
Health impacts of natural and added nutrients in foods 2018-2021

Monash University, Australia
Fraunhofer ISE
Water Technologies 2018-2021

Stellenbosch University, South Africa
Fraunhofer ISE, IGB & ISOB
Water Technologies 2018-2021

Stellenbosch University, South Africa
Fraunhofer ISE, IGB & ISOB
Health impacts of natural and added nutrients in foods 2018-2021

QuTech, Netherland
Fraunhofer ILT
Optical components for the quantum internet 2019-2022

Radboud University Medical Center, Netherlands
Fraunhofer MEVIS
Automation in Medical Imaging 2015-2018

University of Auckland, New Zealand
Fraunhofer IPA
Sensing and Actuation Technology for Human Exoskeletons 2015-2018

completed ongoing
The role of INCO in Horizon Europe and specific issues important for RTOs

The role of INCO

- INCO helps building long-term, trusted ecosystems of RD&I partners along industrial value chains (amongst others)
- In some domains INCO is inevitable e.g.
  - Climate protection
  - Sustainable business practices
  - Technological contribution to SDGs

Specific issues

- Acceptance on both sides (involving stakeholders on every side) is key
- Technological links must be given
- Platforms for exchange and excellent partners needed (e.g. WAITRO)
>2/3 of Fraunhofer Institutes are engaged in projects with Chinese partners

- Fraunhofer project volume in China 2018: € 19,1 m
- Foreign project volume worldwide: China ranking #4

- **Fraunhofer Representative Office** in Beijing since 1999

- 2 newly-opened Fraunhofer Project Centers with Shanghai Jiao Tong University
  - **Smart Manufacturing** (Fraunhofer IPA)
  - **Urban ECO-Development** (Fraunhofer IBP)

Fraunhofer Representative Office in the Landmark Tower in Beijing
Fraunhofer activities in Africa

- Membership in the **World Association of Industrial and Technological Research Organizations**
  - Founded in 1970 under the auspices of the United Nations system
  - Since January 2019: Fraunhofer is hosting the WAITRO Secretariat
  - Over 100 Research and technology organizations (RTOs) in 75 countries
  - About **40% of the member organization are from African countries**

- **SAIRA – THE OPEN INNOVATION HUB FOR SUSTAINABLE DEVELOPMENT** ([www.saira.eco](http://www.saira.eco))
  - Open Innovation Platform developed by the Fraunhofer-Gesellschaft
  - SAIRA connects
    - Researchers with Researchers
    - Companies and SMEs with Researchers
    - Start-ups with Researchers
    - NGOs and Government Organizations with Researchers (WAITRO members)
Fraunhofer activities with South Africa

Stellenbosch University
- Since 2018 a consortium of four Fraunhofer-Institutes cooperates with Stellenbosch University Water Institute
- **Scientific research** aims towards the development of energy efficient and sustainable water supply technologies
- To further strengthen ties between both research institutions a **“Fraunhofer Innovation Platform for the Water-Energy-Food Nexus at Stellenbosch University” (FIP-WEF@SU)** will commence in 2020

Nelson-Mandela University and Aerosud Aviation Pty
- Trilateral cooperation between Fraunhofer IWU, Nelson-Mandela University and Aerosud Aviation
- Focus on **applied research** on efficient automatic maintenance and repair of carbon fiber reinforced aircraft structures
#WHATSNEXT

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