IPIC 2017

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Towards a smart hyperconnected era of efficient and sustainable logistics, supply chains and transportation

IPIC 2017 - 4th International Physical Internet Conference

July 4-6, 2017 | Graz University of Technology, AUSTRIA

TU Graz

Institut für Technische Logistik

IPIC 2017

LogistikWerkstatt Graz

Assoc.Prof. DI Dr.techn.
Christian Landschützer

Graz, 4.7.2017

TU Graz

Why you are in Graz

The beginning

- Long before the 2000s – publications within the IMHRC
- IMHRC-colloquium in Graz 2004

The PI entrance 2010/11

Prof. Oser **Prof. Meller** **Prof. Jodin (+2017)**

The „Logistikwerkstatt Graz“












Professors (selection 2021 – 2015):
Wehking, tenHompel, Kartnig, Jodin, Oser, Schmidt, Furmans, Zsifkovits, Nendel, Henke, Günthner, Ballot, Overmeyer, Meller

TU Graz

International conference on intralogistics

science meets industry

LogistikWerkstatt Graz

- 2012: resource efficiency in logistics
- 2013: solution day
- 2014: resource efficiency versus performance ?!
- 2015: intralogistics 4.0

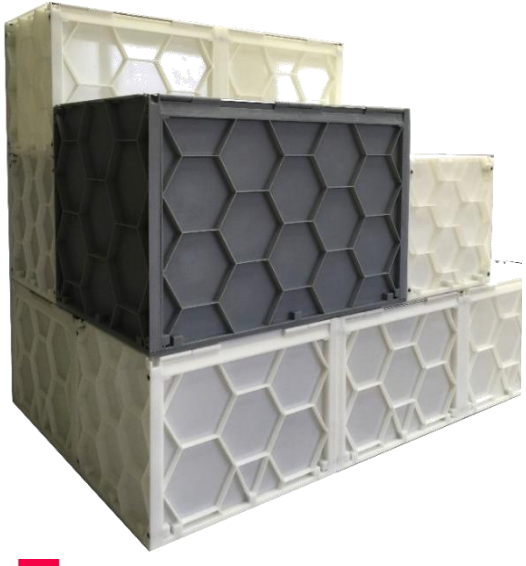
facts:

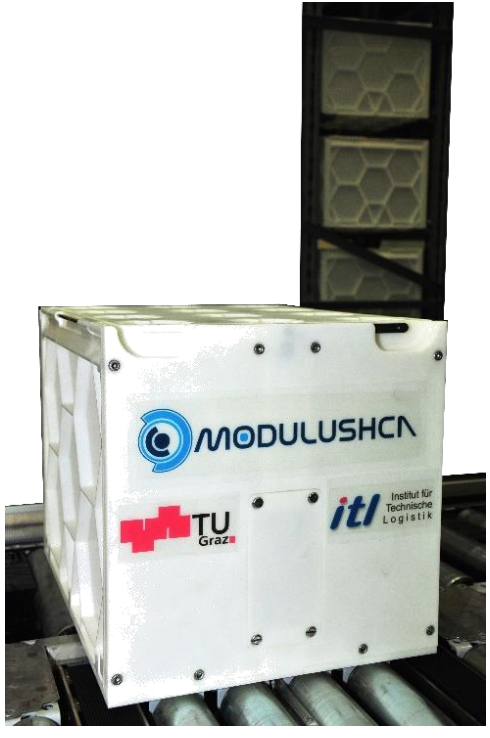
- 70 attendees (average)
- support from KNAPP and SSI Schäfer
- student forum
- Broadly acknowledged and well accepted by science and industry with 16 companies presenting

To be continued in 2018/19

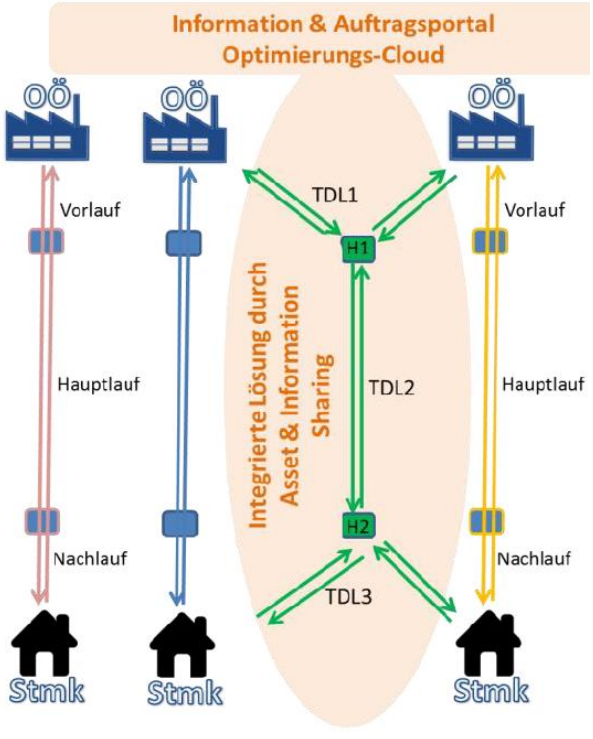
„Engineering and producing the first physical object of the Physical Internet“

Dirk Jodin (2014)





go2PI – protoPI



Austrian approaches on a PI realization

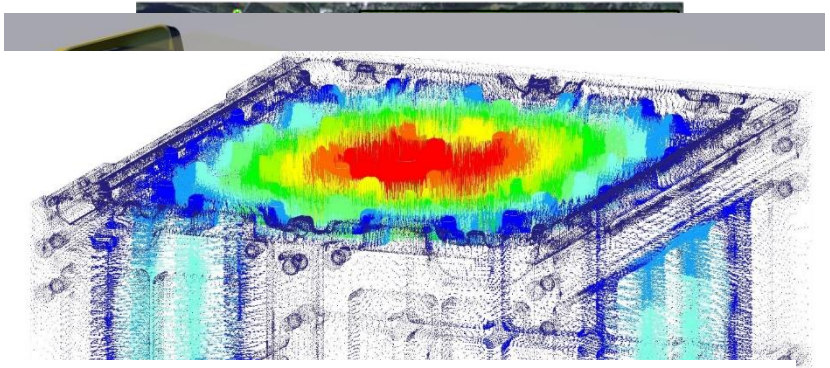
gotoPI

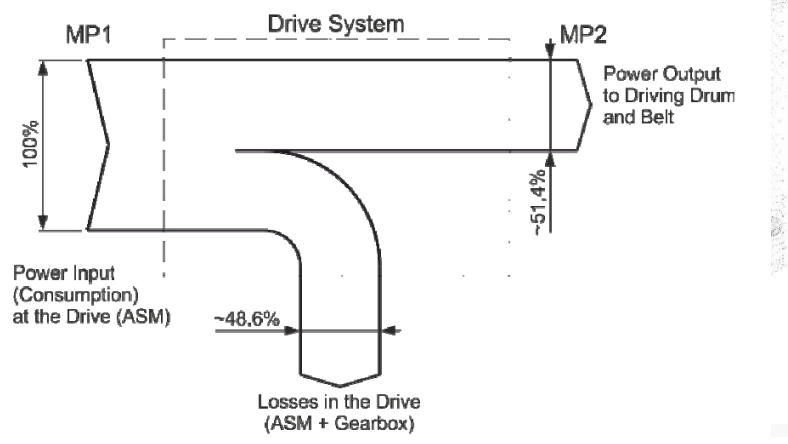
- Defining guidelines for an open logistic system for an automotive supplier. Integration of technology and business models.

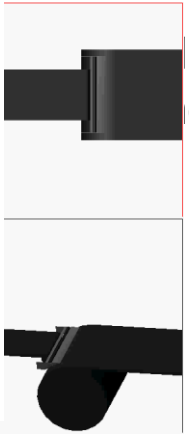
→protoPI

- Consolidation of shippers, customers for high efficiency alongside an austrian test case (counties: OÖ-Stmk)
- Developing:
  processes, PI-Infrastructure, PI-Hypersystem, PI-containers

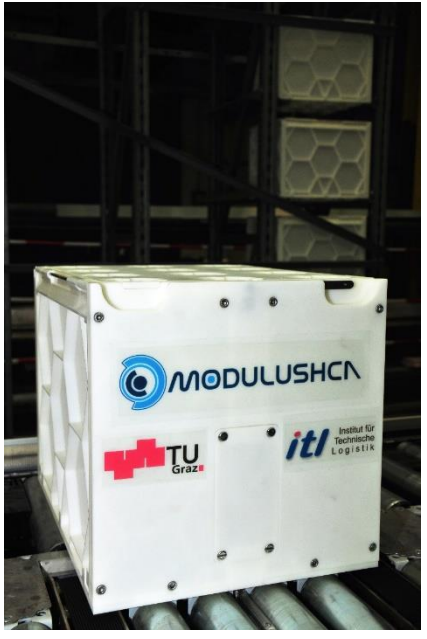
The PI (mechanical) engineers







- PI fundamentals
- Urban logistics
- New logistics technology (start-up)
- Optimization
  - processes
  - machinery
  - uipment
  - ergy efficiency



PI in Austria

National Funding

- Roadmaps, long term visions and goals
- Block 7 „PI activities“, July 5th
- Project examples: Poster session, July 4th

Networking and coordination

- National mirror groups (ALICE, HORIZON 2020)
- Research coordination:
  TU Graz, WU Wien, University of Vienna, AIT, Fraunhofer Austria, FH OÖ, FH Logistikum,…

Industry

- Growing interest
- PI test cases

Highlights and modus 2017

New scientific format

- Review process, proceedings (printed, e-book)

Pillars of the program

- Plenaries (5 keynotes) – one completely out of logistics
- „CEOs best of“
- Elevator pitch for start ups
- Gala dinner with PI awards, PI keynote and official representatives
- Project contributions with workshops
  (thanks to Clusters 2.0, CORE and UMi-TWINN)
- 13 keynotes in workshops (panels)
  – papers submitted assigned
  - 3 parallel sessions
  - Workshop on nat. and int. funding
  - Workshop on PI fundamentals
- Industry program (thanks to KNAPP AG)

Attendees

50 scientific contributions

245 attendees from 21 nations

Makers of the conference

Scientific Committee

- Christian Landschützer: TU Graz, Austria (Chair and Operative Leader)
- Florian Ehrentraut: TU Graz, Austria (Co-Chair and Operative Co-Leader)
- Benoit Montreuil: Georgia Tech, USA (Co-Chair)
- Oliver Schauer: FH OÖ Forschungs & Entwicklungs GmbH, Austria (Co-Chair)
- Michael Affenzeller: FH OÖ Campus Hagenberg, Austria
- Diane Ahrens: TH Deggendorf/TC Grafenau, Germany
- Angelos Amditis: Institute of Communication and Computer Systems (ICCS), Greece
- Eric Ballot:PSL – Mines ParisTech, France
- Yan Cimon: Université Laval, Canada
- Karl Dörner: Universität Wien, Austria
- Rod J. Franklin: Kühne Logistics University, Germany
- Norbert Hafner: Graz University of Technology, Austria
- Árni Halldórsson: Chalmers University of Technology, Sweden
- Wout Hofman: TNO, The Netherlands
- Walid Klibi: Kedge Business School, France
- Suzanne Marcotte :UQAM, Canada
- Shenle Pan: PSL – Mines ParisTech, France
- Matthias Prandtstetter: AIT, Austria
- Maria Jesus Saenz: Zaragoza Logistics Center (ZLC), Spain
- Jens Schumacher: FH Vorarlberg, Austria
- Sandra Stein: Fraunhofer Austria GmbH and TU Wien (Vienna), Austria
- Georg Simhandl: ADAPTIVIA GmbH, Austria
- Lóránt (Lóri) Tavasszy: Delft University, The Netherlands
- Iris F.A. Vis: U. Groningen, The Netherlands
- Tina Wakolbinger: WU Wien, Austria

TU Graz

Organizing and program committee

- Christian Landschützer: TU Graz, Austria
- Florian Ehrentraut: TU Graz, Austria
- Benoit Montreuil: Georgia Tech, USA
- Maximo Martinez: P&G, Belgium
- Fernando Liesa: ALICE, Belgium

Hosts

- Interim head of the institute „Logistics Engineering“ Prof. Hick
- Rektor TU Graz Prof. Kainz

Platinum Sponsors

In its responsibility for applied research in Austria the Austrian Ministry for Transport, Innovation and Technology (**bmvit**) aims

- to increase the research, technology and innovation (RTI) intensity of the Austrian business sector,
- to develop technologies for a modern, efficient, reliable and safe infrastructure for overcoming the major challenges of the future and
- to increase the number of people employed in the area of technology and innovation. Therefore bmvit is taking measures on RTI grants and provides RTI programmes like Mobility of the Future, which addresses amongst others new solutions for sustainable transport logistics and goods transport.

Platinum Sponsors (Supporter)

Das Land Steiermark

➔ Gesundheit, Pflege und Wissenschaft

The **Department of Science and Research** (Division 8 - Health, Nursing and Science) sees itself as a hub and service center in the regional research promotion network; It is also the office of the future fund Styria as well as the office of the Research Council of Styria.

We are committed to our promotion activities both as a science policy mission and as a social concern and feel committed to the "Styrian Scientific Community". We also provide impulses where it is not simply the provision of funding, but the elaboration of future-oriented strategies in the field of science, research and development.

Gold Sponsors

The **KNAPP Group**, headquartered in Hart bei Graz, operates internationally in the field of warehouse automation and warehouse logistics software. With its feel for trends and new market requirements combined with its innovative solutions, KNAPP has put its stamp on the intralogistics sector and invests about 30 million euros each year in R&D.

High quality of life, thriving business, education and culture are defining traits of the **capital of Styria** Province.

TGW Logistics Group is a leading systems provider of highly dynamic, automated and turnkey logistics solutions worldwide. Since 1969 the company has been implementing a diverse range of internal logistics solutions, from small material handling applications to complex logistics centres.

Silver Sponsors

Das Land Steiermark

MARLO

logistics research austria

SSI SCHÄFER

MIX MOVE MATCH

PTV GROUP
the mind of movement

JUNGHEINRICH
Machines. Ideas. Solutions.

cleardestination

TU Graz

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Project contributions

The overall aim of the **UMi-TWINN project** is to reinforce the scientific excellence and innovation capacity in logistic systems of the University of Miskolc (UMi) and its high-quality Twinning partners for the benefit of different industries and logistics markets. To achieve this aim, the 3 year project will build upon the existing strong research and innovation base of UMi and its twinning partners Fraunhofer-Gesellschaft e.V. IFF (Fraunhofer), Technische Universitaet Graz (TU Graz) and Intelligentsia Consultants (Intelligentsia).

The vision of **Clusters 2.0** is to leverage the full potential of European Logistics Clusters for a sustainable, efficient and fully integrated transport system. Clusters 2.0 will use an Open Network of Logistics Clusters operating in the frame of Ten-T. It will support local, regional and European development, while keeping neutral the local impacts such as congestion, noise, land use and local pollution levels.

TU Graz

Project contributions

The objective of the **CORE** project is to enable secure and compliant seamless goods flows, based on supply chain visibility. Sharing and access to real time data is a prerequisite to achieve this objective. This session provides the approach taken by the project, show an example of the implementation of this approach and report on an example of its implementation in supply chains.

Supporter of the conference

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Georgia Tech Supply Chain & Logistics Institute

WKO TRANSPORT · VERKEHR

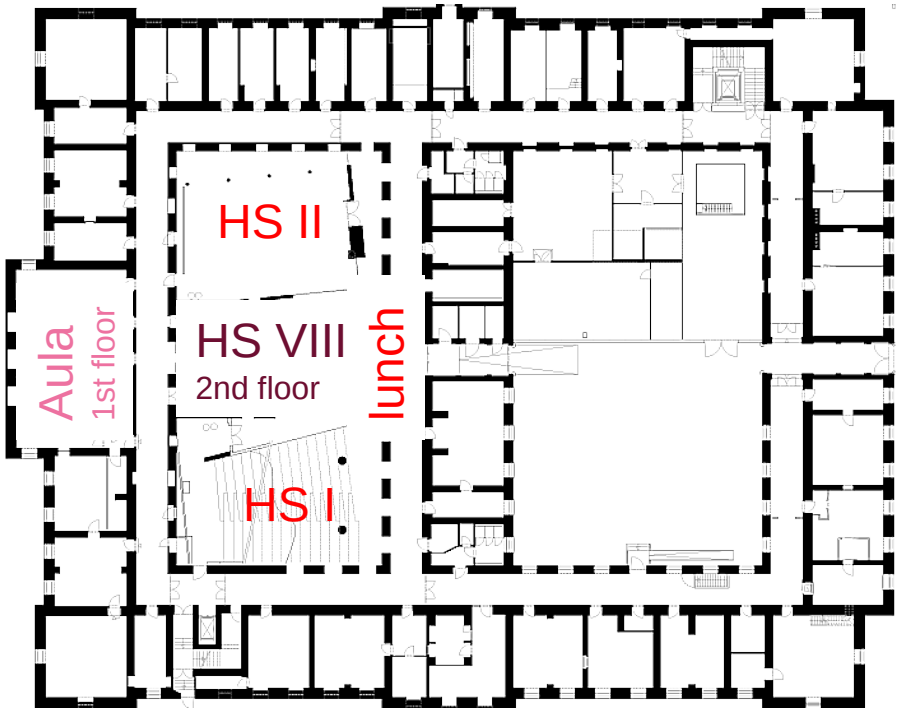
The Consumer Goods FORUM
The Global Network Serving Shopper & Consumer Needs

BVL Bundesvereinigung Logistik Österreich

TU Graz

Hosting sponsors

Venues



Rooms

- HS I: lecture hall basement
- HS II: conference office basement
- HS VIII: lecture hall 2nd floor
- Aula: lecture hall 1st floor
- Foyer: lunch, refreshments basement

IMPORTANT ANNOUNCEMENT

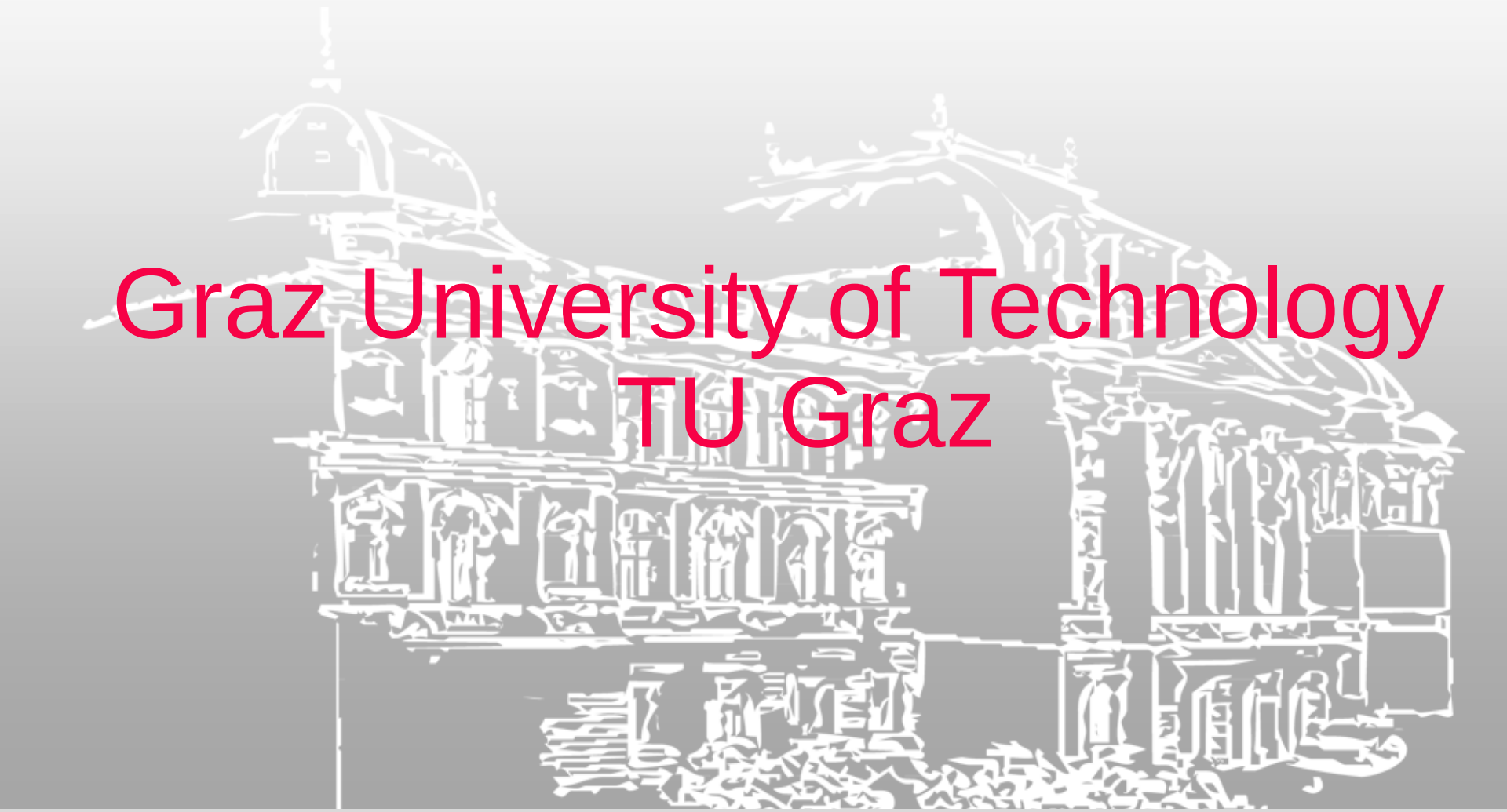
TU Graz

Team at your disposal

Look out for staff with TU Graz pins

Reception desk open daily

- Administrative issues (registration,…)
- Information on the programm (sessions)
- Organizational help (IT - WIFI, Hotel, food,…)
- Friday social event registration



Graz University of Technology
TU Graz

Facts and Figures

- Students total (as of Dec. 2016) **13,454**
  - Percentage of women 23.1%
- Graduates (acad. year 15/16)
  - Bachelor's Programmes 1,008
  - Master's Programmes 768
  - Doctoral Programmes 180
- Study Programmes
  - 18 Bachelor's Programmes
  - 33 Master's Programmes (14 of them taught in English)
  - Doctoral Programmes in 14 English-speaking Doctoral Schools

Facts and Figures

TU Graz staff total (December 2016)	3,251
▪ Academic staff	1,534
▪ Third-party funded staff	1,162
Federal budget 2016	152.2 Mio.€
Income from third-party funds 2016	69.4 Mio.€



TU Graz in International University Rankings (selection)

- **Shanghai-Ranking 2016**
  - Mechanical Engineering ranking group 101-150

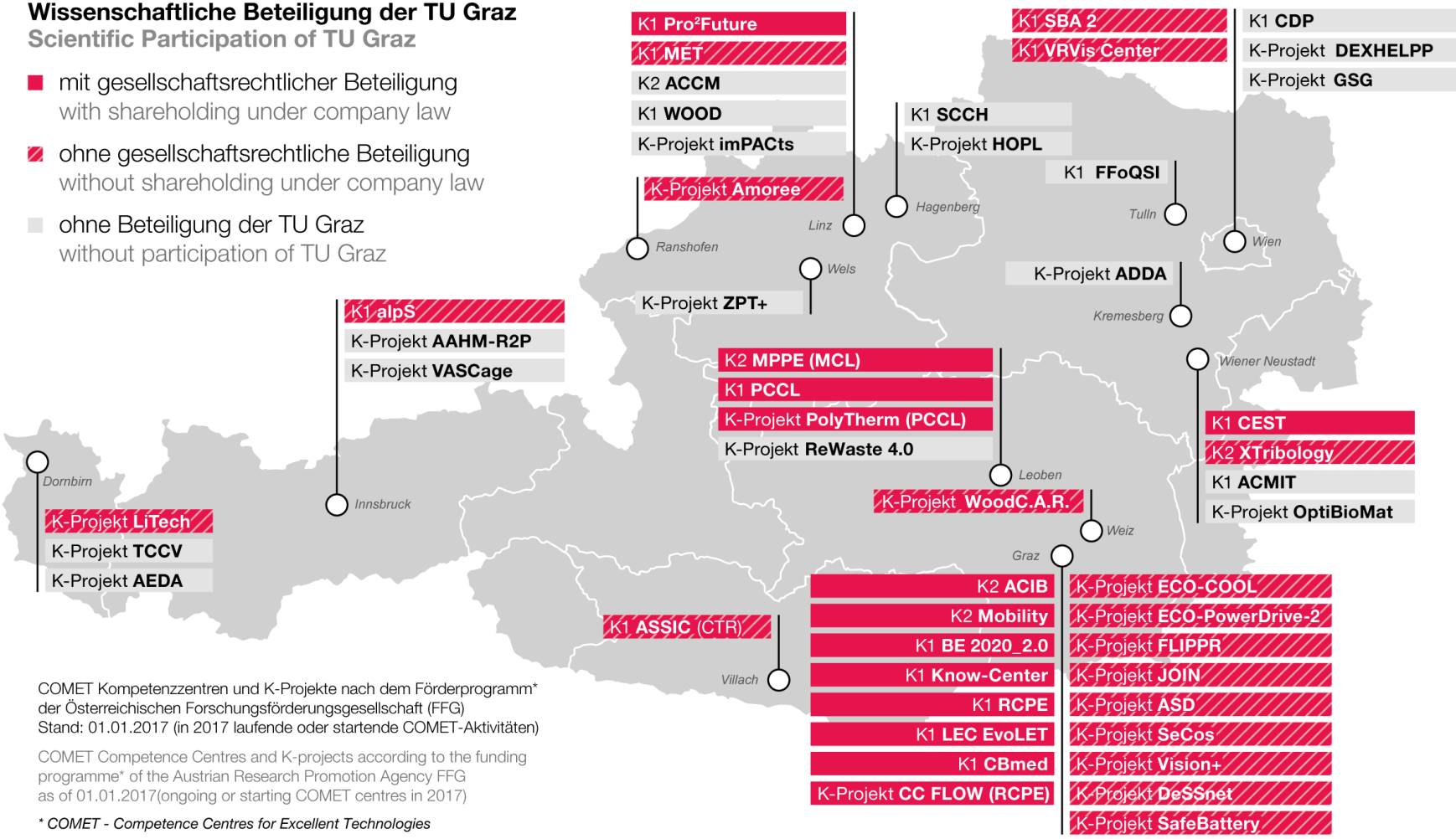
- **U-Multirank 2017 => 10 A rankings, 8 B rankings**

  - ***Research*** => 3 A rankings
  - ***Knowledge Transfer***
    => *A in:* Co-publications with industrial partner
    Income from private sources
    Industry co-patents
    Spin-offs
    Publications cited in patents
  - ***International Orientation*** => *2 A rankings*

TU Graz-Beteiligungen an COMET Kompetenzzentren und K-Projekten in Österreich
TU Graz - Scientific Participation in COMET Competence Centres and K-Projects in Austria

Wissenschaftliche Beteiligung der TU Graz
Scientific Participation of TU Graz

- mit gesellschaftsrechtlicher Beteiligung
  with shareholding under company law
- ohne gesellschaftsrechtliche Beteiligung
  without shareholding under company law
- ohne Beteiligung der TU Graz
  without participation of TU Graz



COMET Kompetenzzentren und K-Projekte nach dem Förderprogramm* der Österreichischen Forschungsförderungsgesellschaft (FFG)
Stand: 01.01.2017 (in 2017 laufende oder startende COMET-Aktivitäten)

COMET Competence Centres and K-projects according to the funding programme* of the Austrian Research Promotion Agency FFG as of 01.01.2017(ongoing or starting COMET centres in 2017)

** COMET - Competence Centres for Excellent Technologies*

Shareholdings

- Valuable instrument for active research cooperation, knowledge and technology transfer
- Company shares in 16 companies (in particular the funding bodies of the COMET competence centres)
- Approx. EUR 100 million in revenue from shareholdings of which are EUR 30 million accountable to TU Graz
- Over 1,100 high-quality jobs
- Over 1,200 scholarly publications per year

Competence Centres in COMET programme

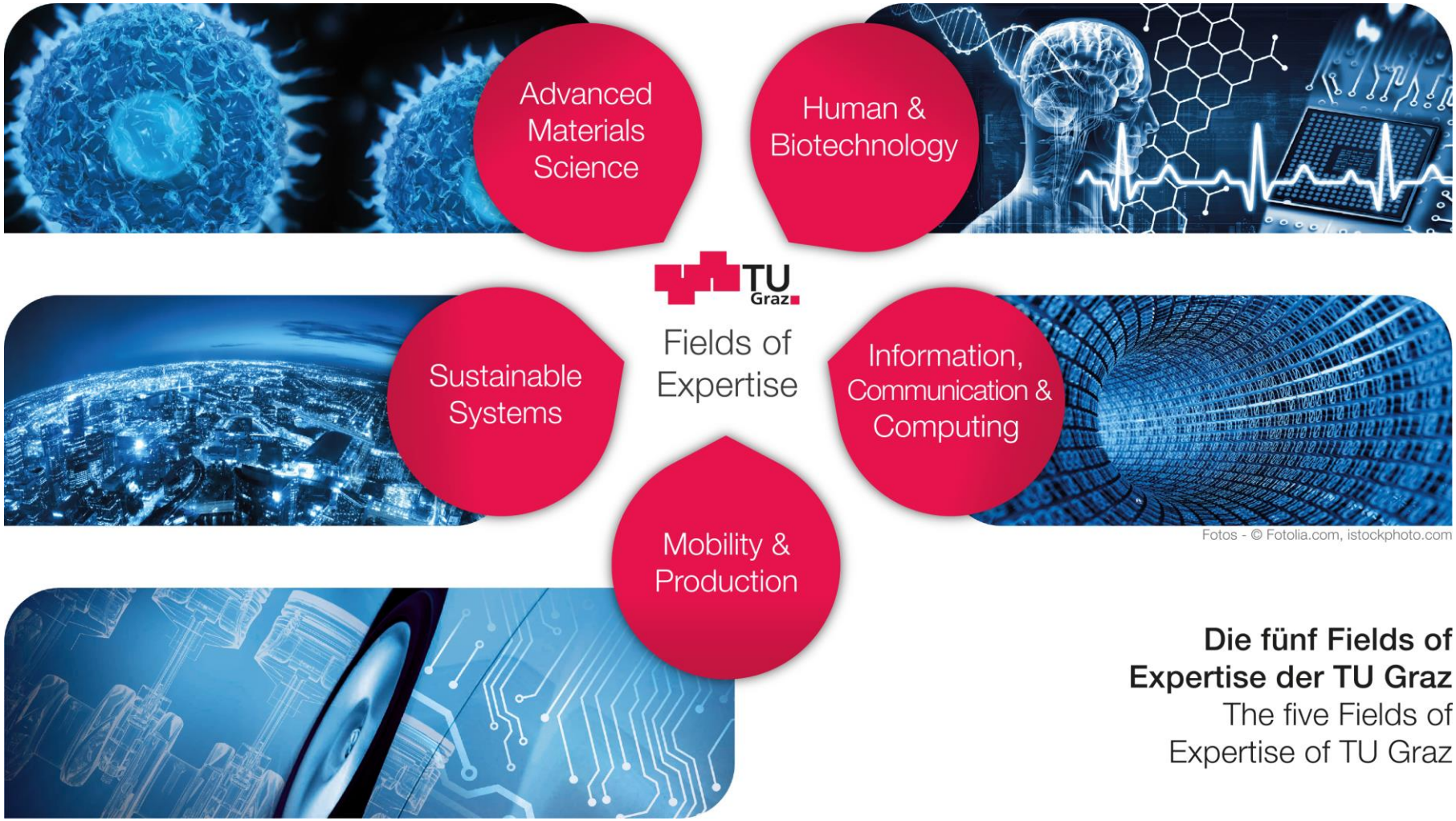
Participation TU Graz:

- **K2-Centres => large scale centres** — ***4 out of 5***
  - International partners of industry and business
  - K2 budget/centre of 15 - 20 million Euros p.a.
- **K1-Centres** — ***13 out of 18***
  - International partners of industry and business
  - K1 budget/centre 5 - 8 mio. Euros p.a.
- **K-Projects** — ***14 out of 26***
  - Term of 3 to 4 years
  - K-Project budget/centre 1 million Euro p.a.

Research at TU Graz

- 5 Fields of Expertise
- Leading position in Austrian Competence Centres (COMET programme) as cooperation of science and industry/business
- 33 EU H2020 Projects including
- 5 ERC Grants
- 6 Christian Doppler-Laboratories
- 30 – 40 patent applications per year
- 10 – 15 granted patents each year

Fields of Expertise



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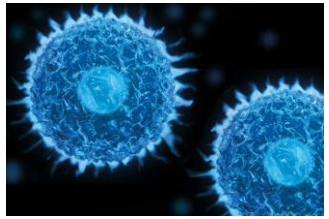
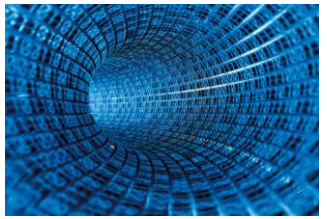
Die fünf Fields of Expertise der TU Graz
The five Fields of Expertise of TU Graz

Fields of Expertise

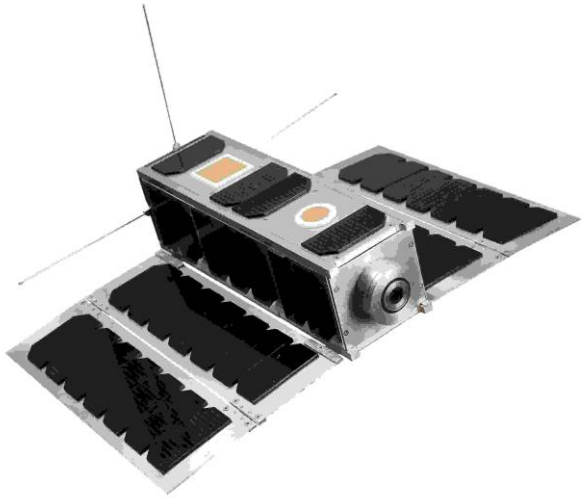
Five promising fields in research and teaching at Graz University of Technology charactarised by

- **Excellence-focused research**
- **Interdisciplinarity**
- **Intensive collaboration**
  with business and industry
- **Strategic partnerships**
  with national and international scientific organisations
- **Participation**
  in scientific competence centres and research networks





Product Innovation Project

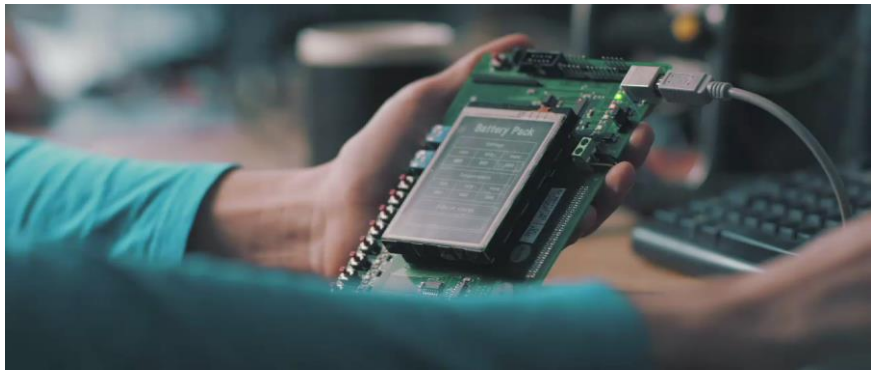


TU Graz Satellite

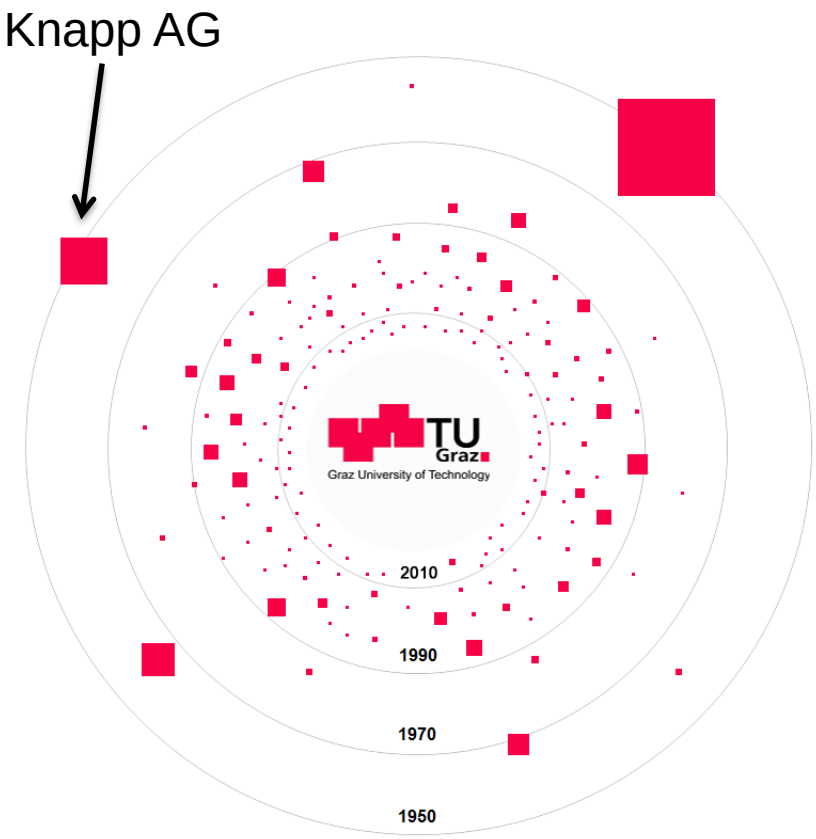
TU Graz Robocup
Rescue Team TEDUSAR

TU Graz Racing Team

Number 2 in the worldwide ranking (of more than 500 teams)



Spin-offs and Start-ups of TU Graz



- Yesterday's TU Graz start-ups are today's technology flagship companies (AVL, Knapp, Anton Paar…)
- Since 1990, more than 150 companies have been founded with more than 6,500 jobs
- Science Park Graz as business incubator

Science · Passion · Technology

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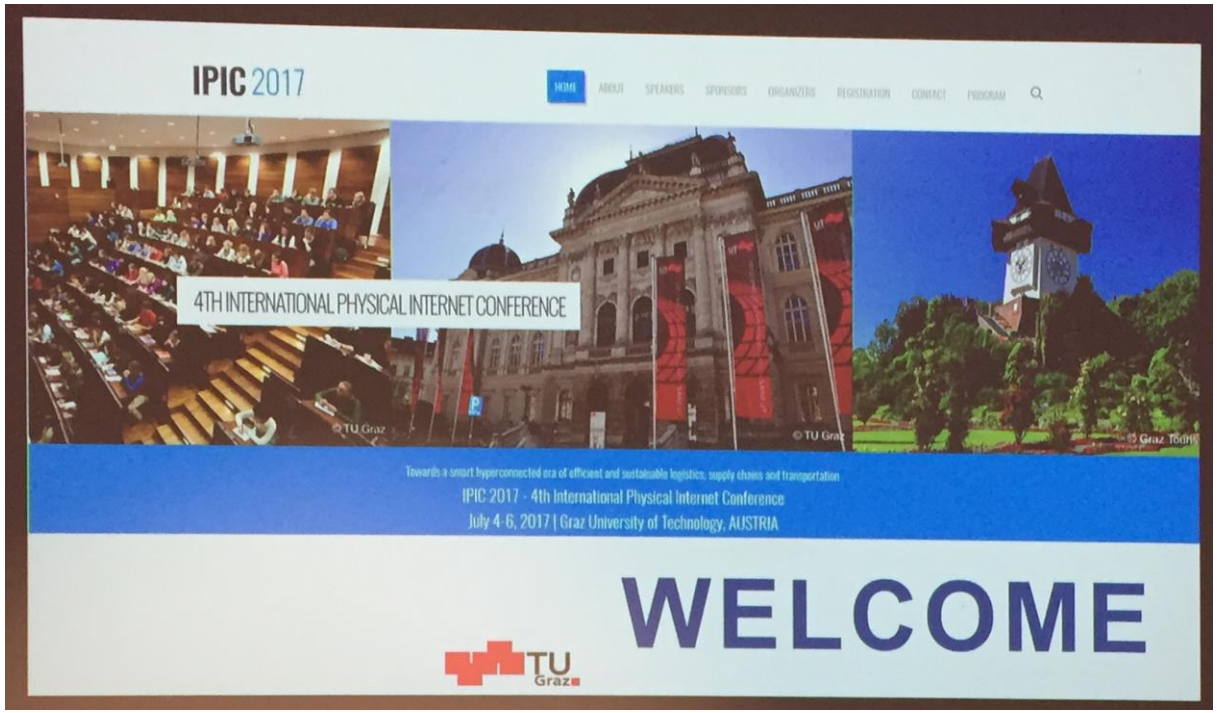

Activities performed partially in the frame of WINN and SETRIS. The WINN/SETRIS project has received funding from the European Union´s FP7 and Horizon 2020 research and innovation Programme under grant agreements No. 314743 and 653739

ALICE Roadmaps

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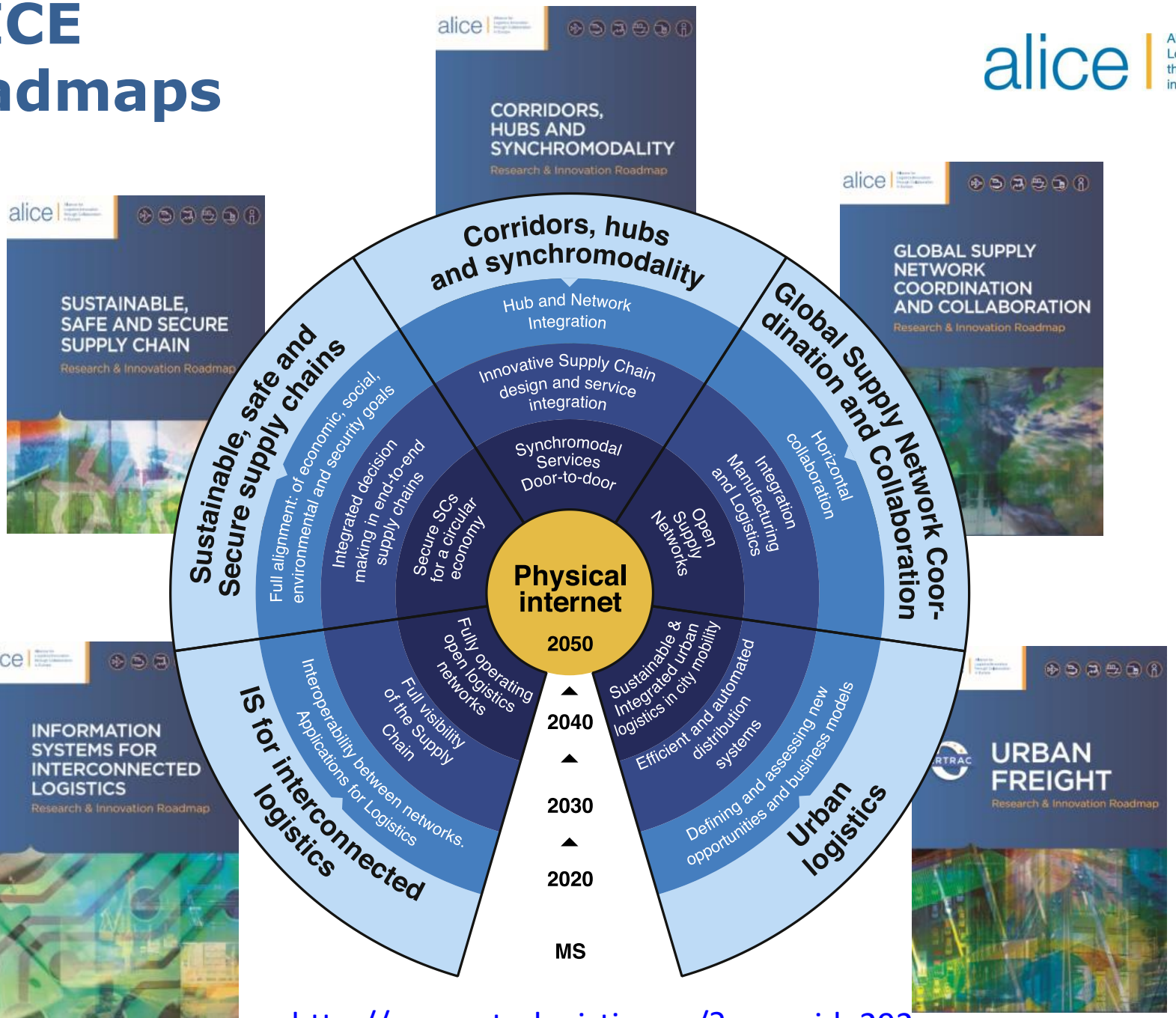

http://www.etp-logistics.eu/?page_id=292

European Commission

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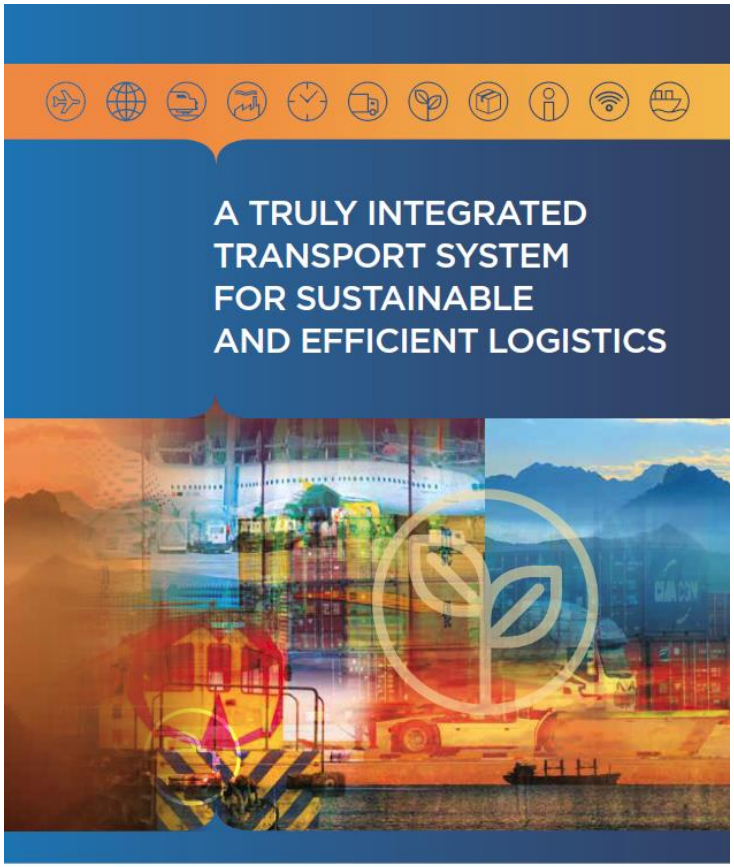

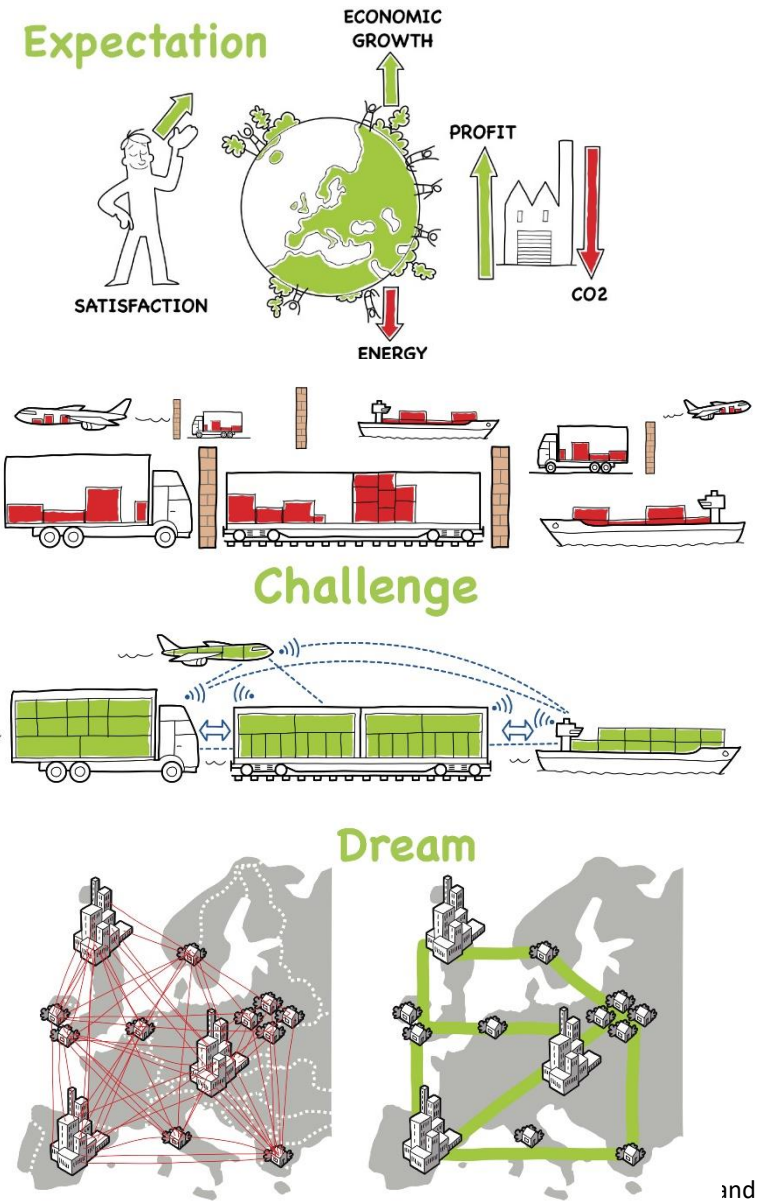

[Report: http://www.etp-logistics.eu/?p=1298](http://www.etp-logistics.eu/?p=1298)

Activities performed partially in the frame of WINN and SETRIS. The WINN, and Horizon 2020 research and innovation Programme under grant agreement

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ALICE membership

Type of Organization	Members	European Associations
Shippers & Retail	P&G, SOLVAY, Ford, Mondelēz International, Groupe Casino Nourrir un monde de diversité, BAYER, BOSCH Invented for life	ESC, cefic, ELUPEG, GS1
Logistics Service Providers, Courier and Postal operators & Freight Forwarders	Gebrüder Weiss, KALEIDO, FM LOGISTIC, Posteitaliane, LINEAS, GEODIS, BORUSAN LOJİSTİK, CHEP	CLECAT, EALTH, UIRR
Ports, Hubs, Intermodal terminals & Transport Infrastructure	INTERPORTO BOLOGNA, valenciaport Autoridad Portuaria de Valencia, Port of Rotterdam, JLL, ect, safel Green logistics, ECO SLC, TRAFIKVERKET	FERRMED, INE Inland Navigation Europe, FEPORT
Vehicle Manufacturers & Logistics operations, handling (modular units)	VOLVO, MAN, DAIMLER, LOGIFRUIT Soluciones de Envase y Logística	eucar
Information and Communication Technologies & Consultancy	AJA Europe, ADVANTECH, argus, MARLO, LOGIT ONE, UIRNet S.p.A., PNO, SILENT SENSORS, everis, IBM, inlecom systems, BIMAR, nallian, log sea, an NTT DATA Company, HaCon, PTV GROUP the mind of movement, GEA, bluegreen, enide, mosaicfactor, interlogistics, NEW OPERA	ERTICO ITS EUROPE, LEAN & GREEN
Regional & Member States Logistics Clusters	VNL Verein Netzwerk Logistik, Euralogistic, CLOSER, LUTB Transport & Mobility Systems, LIMOWA, nov@log Le pôle de compétitivité logistique, VIL Empowering Logistics, EffizienzCluster LogistikRuhr	
Research and technology Centers	Fraunhofer IML, Fraunhofer IFF, KLU, ZLC, Newcastle University, CHALMERS, LOGISTIKUM, MINES ParisTech, TU/e, RISE, CNC-LOGISTICA, ITENE, CATAPULT, BIBA, LRQ, Università della Calabria, ITAINNOVA, TU Delft, TNO innovation for life, rijksuniversiteit groningen, University of Portsmouth	ECTRI, ELA European Logistics Association
European Technology Platforms /PPPs	WATERBORNE, ERRAC The European Rail Research Advisory Council, ERTRAC, EFFRA a MANUFUTURE initiative, MANUFUTURE-EU	
Member States and innovation Funding*	Department for Transport, Ministry of Infrastructure and the Environment, CDTI, Vlaanderen verbeelding werkt, The Government of the Grand Duchy of Luxembourg Ministry of the Economy, bmvit, TUBITAK, DINALOG, Ministry of Transport, Ministère de l'Écologie, du Développement durable et de l'Énergie, VINNOVA, Ministero dell'Istruzione dell'Università e della Ricerca	

partially in the fr /INN and SETRIS. The WINN orc ed t pean Union´s FP7 and Horizon 2020 research and innovation Programme under grant agreements No. 314743 and 653739

European Commission

* *Involved in ALICE Mirror Group*

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Logistics innovation for a more competitive and sustainable industry

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