

The background of the slide features abstract, overlapping green geometric shapes, primarily triangles and polygons, in various shades of green, creating a modern and dynamic visual effect.

MAPDRIVER Roadmap to Boost Demand for Information and Communication Technologies (ICT) in Transport and Logistics

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- ▶ Motivation
- ▶ Roadmap approach and methodology
- ▶ Phase 1: Data collection
- ▶ Phase 2: Stakeholders involvement
- ▶ Phase 3: Analysis of results and selection of instruments
- ▶ Selection of instruments
- ▶ Implementation of selected demand-side policy instruments



Why uptake ICT in transport?

To create intelligent and sustainable transport and logistics systems

- ▶ To make logistics processes more efficient
- ▶ To raise productivity
- ▶ To create working places
- ▶ To improve safety
- ▶ To reduce resources' consumption
- ▶ To decrease traffic congestion



How to stimulate the ICT uptake?

The ICT technologies are mature

- need to be uptaken by the market

How to facilitate
the uptake of
ICT-based innovations
in transport and
logistics?

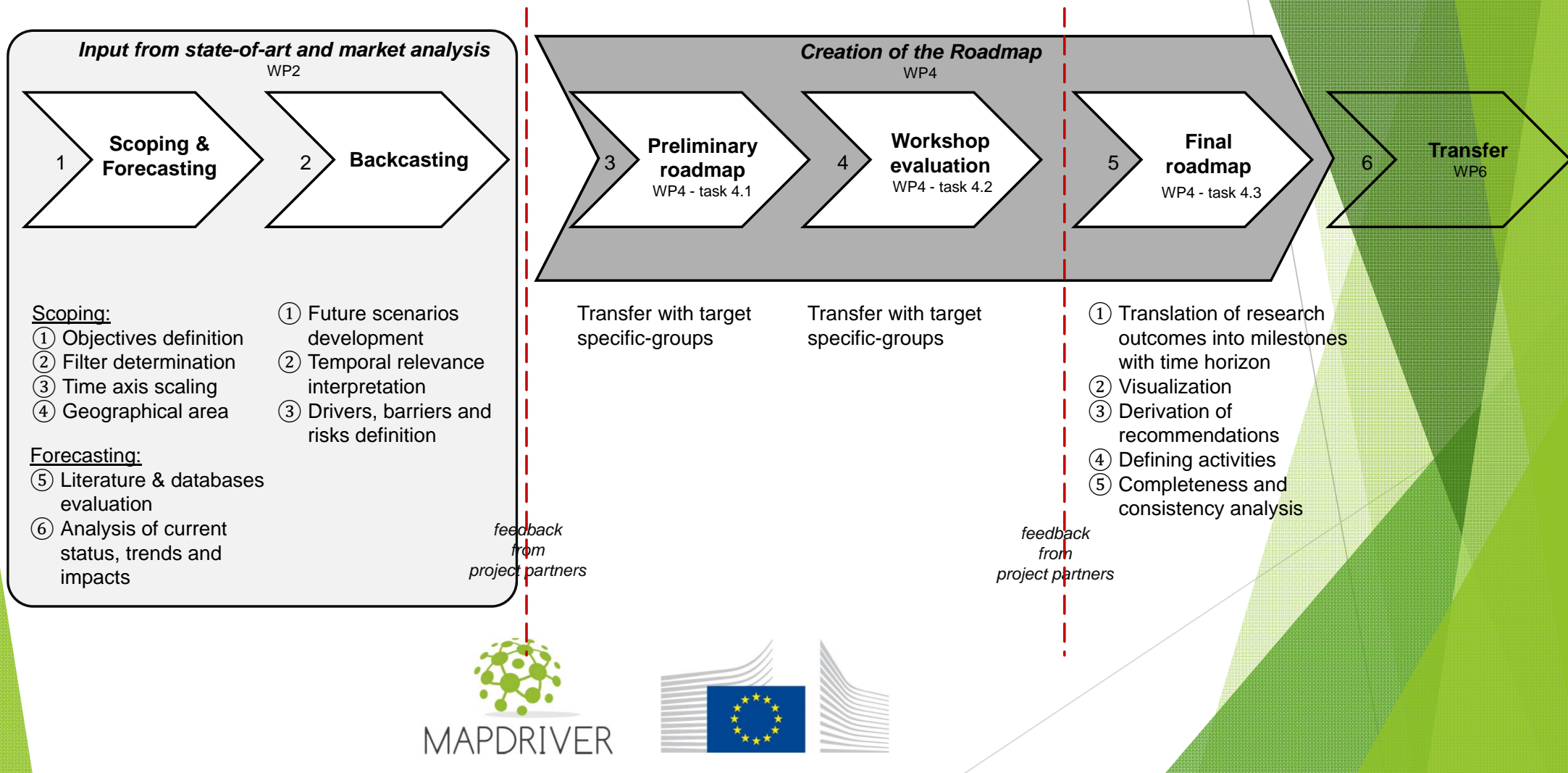
demand-side
innovation policies



MAPDRIVER Roadmap
- recommendations for
implementation of
demand-side policy
instruments



Roadmap approach



Roadmap methodology

Data collection

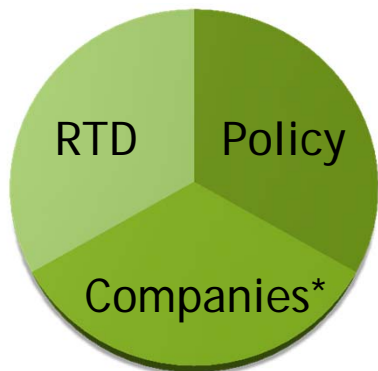
- Literature evaluation
- Terms definition

Stakeholders involvement

- Ex-ante input
- EU-wide survey
- EU-wide workshop
- 3 local workshops

Analysis of results and selection of instruments

- Recommendations
- Implementation
- Risk definition



Triple Helix
Input and Feedback

*large companies and SMEs



Phase 1: Data collection

- ▶ ICT technologies
- ▶ Barriers for implementation
- ▶ Demand-side policy instruments



Focus: Technologies for remote communication and tracing/tracking

- ▶ Barcode Technologies (2D,3D)
- ▶ Radio-Frequency Identification (RFID)
- ▶ GSM/GPRS/UMTS
- ▶ GPS/Satellite Monitoring System
- ▶ Indoor Positioning Systems (IPS)
- ▶ Real-Time Locating Systems (RTLS)
- ▶ Geographic Information System (GIS)
- ▶ Advanced Traffic Management System (ATMS)
- ▶ Fleet Management



Barriers for Implementation

- ▶ High investment and implementation costs
- ▶ High running costs
- ▶ Lack of qualified staff
- ▶ Unclear return on investment
- ▶ Lack of technological standards
- ▶ Data security
- ▶ Organizational barriers
- ▶ Integration with legacy system
- ▶ Long implementation times
- ▶ Difficulties in integration into the company's current systems
- ▶ Insufficient education system and training policies



Demand-side policy instruments*

Public actions to induce innovation and/or speed up the diffusion of technologies through increasing the demand of innovation, defining new functional requirements for products and services and/or improving user involvement in innovation production.

*Sources:

- Technopolis report - Developing an evaluation and progress methodology to underpin the intervention logic of the Action Plan to Boost Demand for European Innovations - ENTR2008/006, European Commission - DG Enterprise and Industry, 2013
- NESTA Working Paper 13/13, Review of policy measures to stimulate private demand for innovation. Concepts and effects, Jakob Elder, November 2013
- Public Procurement as a Driver of Innovation in SMEs and Public Services - Guidebook Series "How to support SME Policy from Structural Funds", European Commission, Directorate-General for Enterprise and Industry, Unit B.3: Innovation Policy for Growth, Brussels 2014.



Analyzed demand-side instruments

- ▶ Public procurement of innovation (PPI)
- ▶ Pre-commercial procurement (PCP)
- ▶ Regulations
- ▶ Standardization
- ▶ Support to market demand
- ▶ Tax incentives
- ▶ Awareness raising campaigns and labelling
- ▶ Lead Market Initiatives (LMI)
- ▶ Support to user-centered innovation

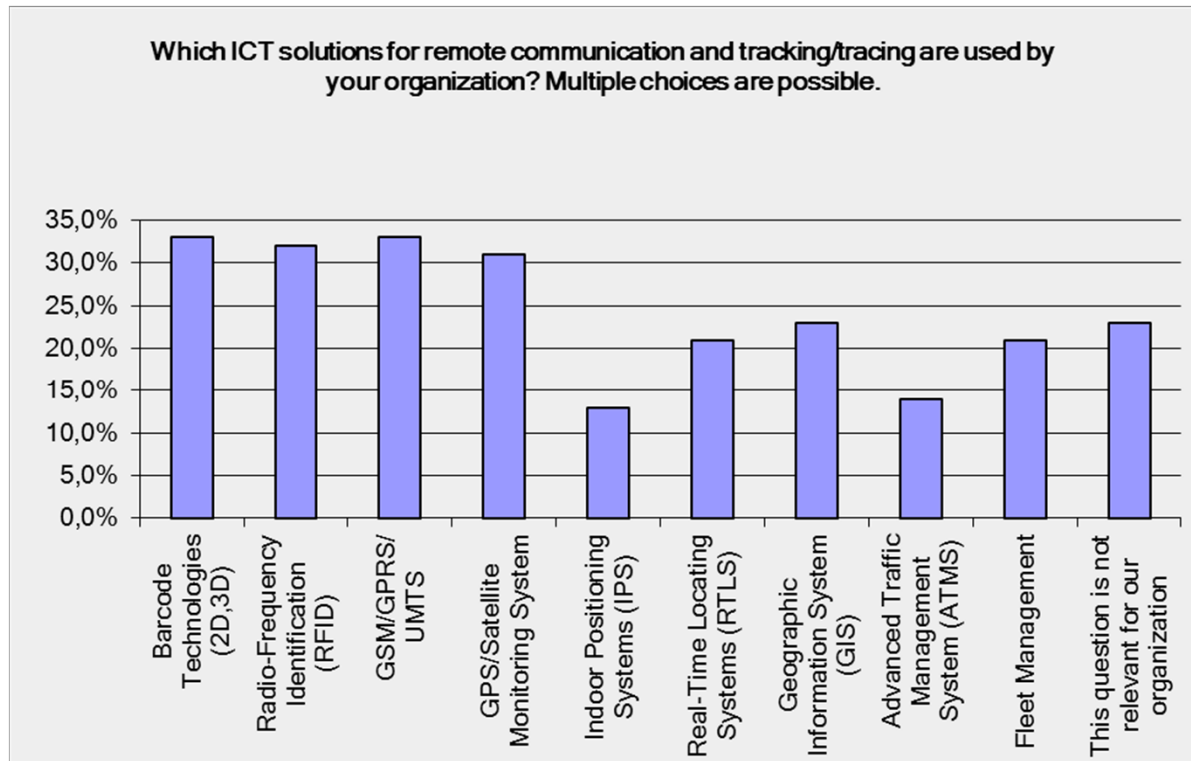


Phase 2: Stakeholders involvement

- ▶ Ex-ante input
- ▶ EU-wide survey
- ▶ Stakeholders workshops

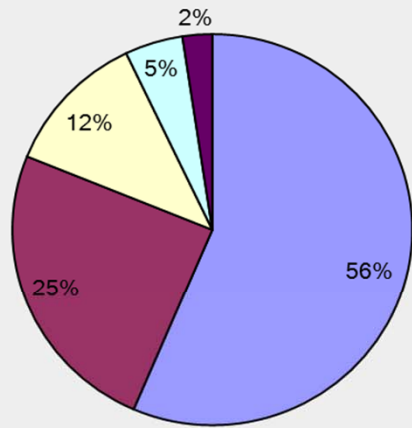


Survey results: ICT in use



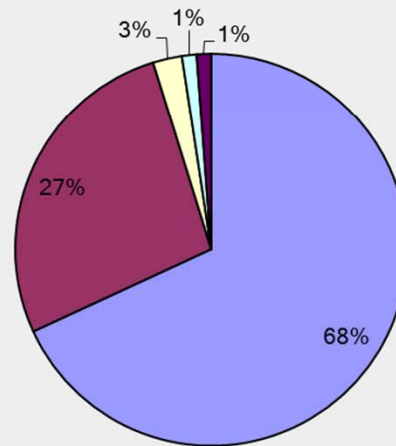
Survey results: ICT importance

What is the level of importance of ICT for the competitiveness of your organization?



For your organization

What is the level of importance of ICT solutions for future success of the logistics sector in your country?



- Very important
- Important
- Neutral
- Not very important
- Not important at all

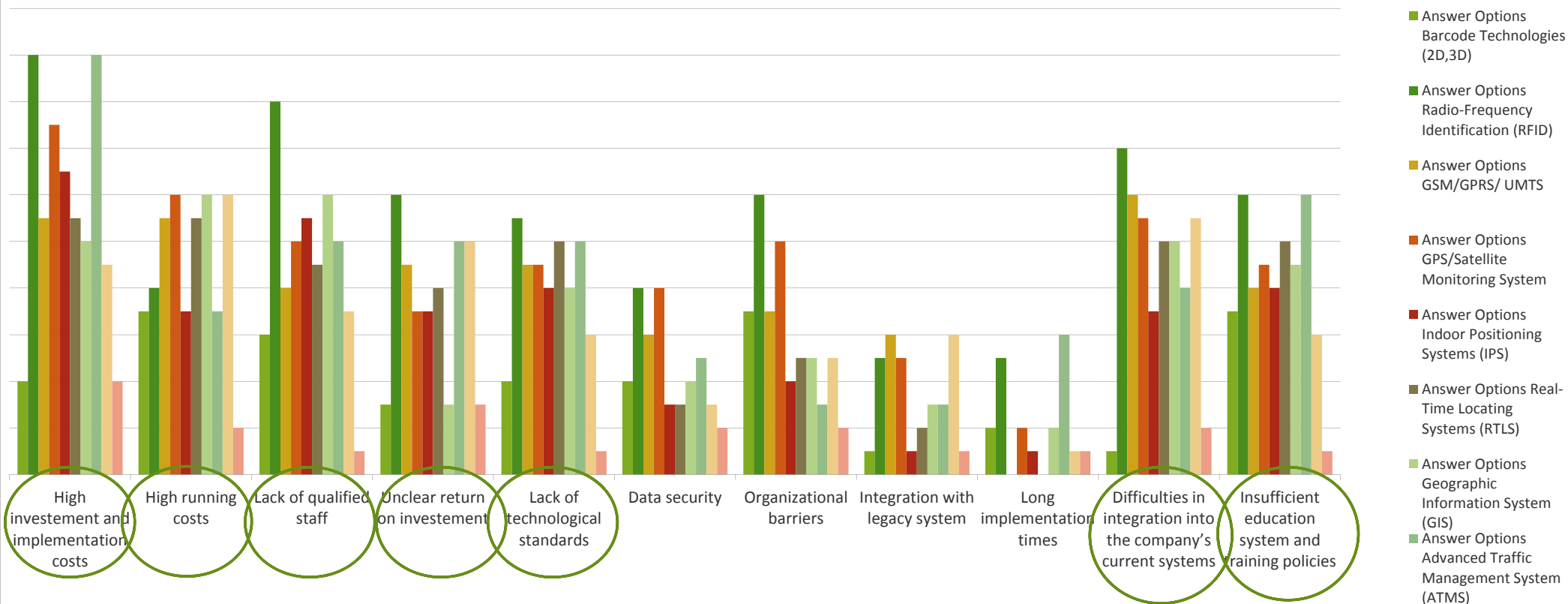
In your country



MAPDRIVER

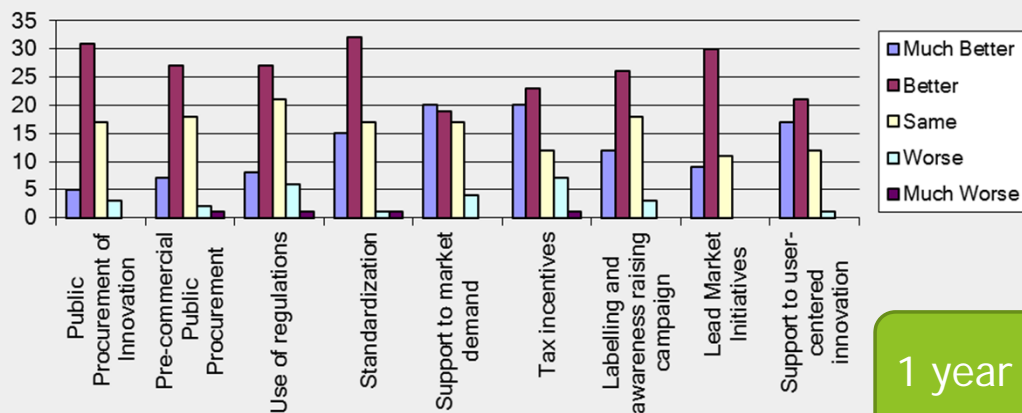


Survey results: Barriers



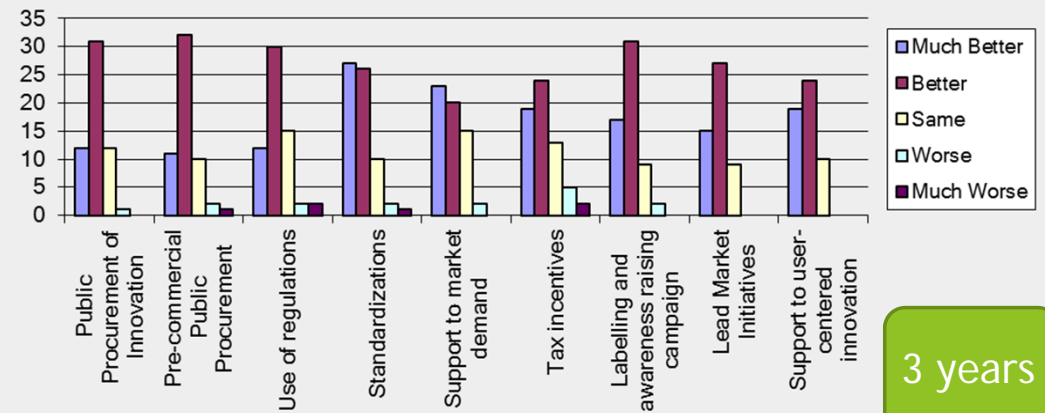
Survey results: Instruments effectiveness

What effect will the instruments have on the uptake of ICT solutions in short term perspective?



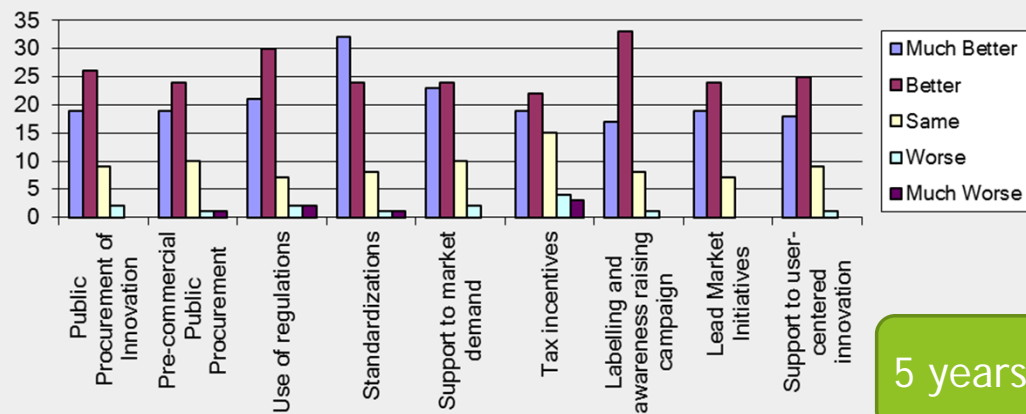
1 year

What effect will the instruments have on the uptake of ICT solutions in middle term perspective?



3 years

What effect will the instruments have on the uptake of CT solutions in long term perspective?



5 years

Survey results: Demand-side instruments effectiveness - summary

Over 50% survey participants (summarized responses “better” and “much better”) estimated the following instruments as having positive influence:

- ▶ **Standardization** (in all three terms)
- ▶ **Awareness rising campaigns** (middle and long term)
- ▶ **Regulations** (long term)

The best valued instruments regarding the “much better” effect on the ICT uptake with 20% and more responses in all three terms are:

- ▶ **support to market demand**
- ▶ **tax incentives**

In the long term **standardization** is the instrument seen as the most effective - 55% of the experts opted for it.



Phase 3: Analysis of results and selection of instruments

- Recommendations
- Implementation
- Risk definition



Selection of instruments

Barriers for ICT uptake and responding demand-side policy instruments

ICT TECHNOLOGIES	1st barrier	2nd barrier	1st demand-side policy instrument	2nd demand-side policy instrument
Barcode Technologies (2D,3D)	Insufficient education system and training policies	High Running costs	Awareness raising campaign	Tax incentives
Radio-Frequency Identification (RFID)	High investment and implementation costs	Lack of qualified staff	Support to market demand	Awareness raising campaign
GSM/GPRS/ UMTS	High investment and implementation costs	Difficulties in integration into the company's current systems	Support to market demand	standardization
GPS/Satellite Monitoring System	High investment and implementation costs	High running costs	Support to market demand	Tax incentives
Indoor Positioning Systems (IPS)	High investment and implementation costs	Lack of qualified staff	Tax incentives	Awareness raising campaign
Real-Time Locating Systems (RTLS)	High investment and implementation costs	High Running costs	Support to market demand	Tax incentives
Geographic Information System (GIS)	High running costs	Lack of qualified staff	Tax incentives	Awareness raising campaign
Advanced Traffic Management System (ATMS)	High investment and implementation costs	Insufficient education system and training policies	Support to market demand	Awareness raising campaign
Fleet Management	High running costs	Difficulties in integration into the company's current systems	Tax incentives	Standardization

Implementation



Standardization (1)

Technical standards are introduced to maximize compatibility, interoperability, safety, repeatability and quality. The state can also stimulate self-regulation (norms, standards) of firms and support / moderate this process.

Aims

- ▶ Enable fast and smooth integration of new technologies into the company current systems
- ▶ Contribute to the reduction of the implementation costs by using standardized and easy accessible solutions
- ▶ Cause the continuous reduction of running cost since standardized goods can be produced cheaper (mass production)



Standardization (2)

Related barriers

- ▶ High investment and implementation costs
- ▶ High running costs
- ▶ Difficulties in integration into the company's current systems
- ▶ Unclear return on investment

Key stakeholders

- ▶ Transport and logistics companies
- ▶ ICT developers and integrators
- ▶ Research organizations
- ▶ Policy makers



Applicable to Technologies

- ▶ Radio-Frequency Identification (RFID)
- ▶ GPS/Satellite Monitoring System
- ▶ Indoor Positioning Systems (IPS)
- ▶ Real-Time Locating Systems (RTLS)
- ▶ Geographic Information System (GIS)
- ▶ Advanced Traffic Management System (ATMS)
- ▶ Fleet Management

Standardization (3)

Recommendations	Implementation
Perform an ex-ante assessment of specific existing regulations and standards with regard to their impact on uptake of ICT in transport	Make a feasibility study on the enforcement of existing standards or of a specific regulation.
Define an international standard to enforce or develop a national/regional one	<ul style="list-style-type: none">➤ Create an EU Standard Committee.➤ Launch a process for analyzing the opportunities to improve the regulatory regime through standards/regulations.
Raise awareness among stakeholders on standardization and launch demonstration projects	<ul style="list-style-type: none">➤ Hold seminars, trainings and workshops (at national, regional and/or local levels).➤ Produce and distribute information materials (leaflets, etc.).➤ Launch demonstration projects - best practice on how standards should be implemented.
Strengthen stakeholders consultation before enforcing an existing or new standards	<ul style="list-style-type: none">➤ Provide training for experts to involve them in the standardization process➤ Contact and involve directly SMEs➤ Support for the spreading of standards
Support of innovation-friendly private standardization activities	Stimulate defining of standards by companies on the basis of their requirements and support/moderate this process keeping in mind existing standardization background.

Awareness raising campaigns (1)

Information campaigns and advertisement of new solutions, conduction of demonstration projects.

Aims

- ▶ Create confidence in innovative technologies (targeting also employees)
- ▶ Increase willingness of companies to uptake ICT solutions
- ▶ Foster collaboration of industry/science and transfer



Awareness raising campaigns (2)

Related barriers

- ▶ Insufficient education system & insufficient training policies
- ▶ Lack of qualified staff
- ▶ Organizational barriers
- ▶ Difficulties in integration into the company's current systems
- ▶ Unclear return on investment

Key stakeholders

- ▶ Transport and logistics companies
- ▶ ICT developers and integrators
- ▶ Research organizations
- ▶ Educational Institutions
- ▶ Policy makers



Applicable to Technologies

- ▶ Barcode (2D, 3D)
- ▶ Radio-Frequency Identification (RFID)
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- ▶ Advanced Traffic Management System (ATMS)
- ▶ Fleet Management



Awareness raising campaigns (3)

Recommendations	Implementation
Launching of demonstration projects to create confidence in technology in general public and key target groups	Web-based demonstrator of best practices on technology usage in every EU country as a long-term platform for further demand-oriented initiatives; media campaigns, press releases, interviews and academic-industry panel sessions, brochures, etc.
Information campaigns for reduction of information asymmetries on technologies uptake or lack of awareness	Information campaigns for stakeholders in form of workshops (e.g. world café) to review their knowledge and share practical experience on technology usage and possible benefits (time, security, cost savings).
Labeling campaigns targeted at logistics companies and ICT providers to showcase the process and financial advantages of ICT innovation uptake	<ul style="list-style-type: none"> ➤ Labelling campaign “innovative logistic company” - creation of methodology and neutral mechanism to handle out a label to products and services (effect can be increased by cost saving for labeled products & services). ➤ Labelling campaign “innovative educator for smooth logistics” - creation of a number of educational activities to teach how and why to use the technology, analysis of diffusion effects of this activity.
Education campaigns targeted at logistics companies and ICT providers to educate regarding the implementation and use of innovative technologies	<ul style="list-style-type: none"> ➤ Campaigns rising awareness about the opportunities to uptake new technologies on this basis of pre-existing technologies. ➤ Educational campaigns for industry and logistics firms on how to use technology to save costs and analysis of investments in technology after the measure (to be jointly offered by universities and ICT providers).
Foster university-industry collaboration and partnership programs targeted at qualifying staff and workplace learning	<ul style="list-style-type: none"> ➤ Funding program for demonstrator university-industry projects to create confidence in certain cooperation areas. ➤ Funding line for open science web-based knowledge transfer partnerships to communicate the benefits of technology for usage and studying. ➤ Specific topics in general funding and PhD exchange programs (Erasmus plus, Marie Skłodowska Curie, etc.).

Support to market demand (1)

The purchase of innovative technologies by consumers or industrial users is directly subsidized.

Aims

- ▶ Lower the entry cost of an innovation by direct subsidy
- ▶ Increase willingness of companies to uptake ICT solutions by financial support (e.g. funding of innovative projects)
- ▶ Foster collaboration of industry/science and transfer in framework of co-funded research and innovation projects (also Public Private Partnerships)



Support to market demand (2)

Related barriers

- ▶ High investment and implementation costs
- ▶ High running costs
- ▶ Difficulties in integration into the company's current systems
- ▶ Long implementation times
- ▶ Unclear return on investment

Key stakeholders

- ▶ Transport and logistics companies
- ▶ ICT developers and integrators
- ▶ Research organizations
- ▶ Policy makers



Applicable to Technologies

- ▶ Barcode Technologies (2D,3D)
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Support to market demand (3)

Recommendations	Implementation
Political level (EU): Establish a long term European strategy to support the uptake of ICT-based innovations	<ul style="list-style-type: none"> ➤ Introduce the support for uptake of ICT-based innovations as one of key priorities of Horizon 2020. ➤ Include this focus in the priorities of the national implementation of structural funds. ➤ Introduce of policies enabling exploiting synergies of funding programs on the EU and national/regional levels.
Operative level (EU): Emphasize economic and societal impact by launching of funding programs for the uptake of innovations	<ul style="list-style-type: none"> ➤ Offer direct subsidies for uptake of innovative ICT-based innovation. ➤ Launching calls for pilot actions to implement selected ICT-technologies / innovations. ➤ Launching of calls to create easily adaptable ICT-solutions based on existing standards which could be fast and relatively cheap implemented by companies and transferred. ➤ Consider establishing a guarantee mechanism to cover the additional costs of innovation or failure. ➤ Establishment of a funding program for companies (buyers of technology, not producer) to uptake the use of technology. The supported firm could get covered up to 40% of the overall costs of implementation projects like internal personal costs, external advice, training and a share of actual purchasing price.
Introduction of direct subsidies (national level)	Subsidies for new technologies - e.g. for catalytic converters in cars to motivate transport companies to invest in new, eco-friendly trucks. This measure can be combined with higher taxes on "old" technologies.

Support to market demand (4)

Recommendations	Implementation
Introducing measures to support market demand by targeting SMEs	<ul style="list-style-type: none">➤ Allocate specific funding to SMEs to support them in enhancing the adoption of new ICT-based solutions thus contributing to their competitiveness on the world market.➤ Establish a high profile label/association of both public and private organizations pleading that they are committed to allocate money to buy innovative products and services from SMEs.➤ Establish a program for SMEs to pilot/test their innovative solutions to the public sector. The program should contain both funding and matching services (second to bring the SME and public body together).➤ Foster cooperation between SMEs, large companies and research institutions by launching programs on cooperative projects.
Foster collaboration of different groups of market actors (large companies, SMEs, public authorities, research institutions) and transfer	<ul style="list-style-type: none">➤ Launch a public-private co-funded research and innovation projects (Public Private Partnerships) with the aim develop new easily adaptable ICT-based solutions.➤ Establish experimental platforms integrated into the real life context (e.g. living labs) for selected ICT technologies in which all actors collaborate on implementing and testing innovative solutions with the final aim of market introduction and adoption.

Tax incentives (1)

Amortization possibilities for certain innovative technologies as tax credit, waiver, rebate etc. The tax incentives on the demand side lower the purchasing price of the innovation and thus try to overcome a range of potential market failures.

Aims

- ▶ Lower the barrier for the uptake of innovative technologies concerned with related expenses
- ▶ Increase willingness of companies to uptake ICT solutions by financial benefits



Tax incentives (2)

Related barriers

- ▶ High investment and implementation costs
- ▶ High running costs
- ▶ Unclear return on investment
- ▶ Integration with legacy system

Key stakeholders

- ▶ Transport and logistics companies
- ▶ ICT developers and integrators
- ▶ Policy makers



Applicable to Technologies

- ▶ Radio-Frequency Identification (RFID)
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- ▶ Indoor Positioning Systems (IPS)
- ▶ Real-Time Locating Systems (RTLS)
- ▶ Geographic Information System (GIS)
- ▶ Advanced Traffic Management System (ATMS)
- ▶ Fleet Management

Tax incentives (3)

Recommendations	Implementation
Introduction of fiscal incentives for innovative ability by law (possible on national level)	<ul style="list-style-type: none">• Offer of tax relief for companies' own research and innovation costs as well as for their R&D investments.• Tax deduction to promote ICT-based innovations which contribute to environment protection (e.g. intermodal transport, logistics with electro mobility, reduction of traffic by efficient fleet management, etc.).• Prescribe tax discounts for the uptake of innovative ICT-solutions by SMEs (a list of particular technologies/ innovations has to be defined).
Introduction of fiscal incentives for companies personal policy (possible on national level)	<ul style="list-style-type: none">• Introduce tax incentives for the costs of training and qualification of staff who will work with new systems in the future.• Set a ceiling for social security taxes in order to balance the employment costs for highly educated specialists.
Higher taxation for "old" technologies	Introduction of higher taxes on old and eco-unfriendly technologies (e.g. older cars with higher emissions) to motivate companies to innovate. This measure can be combined with subsidies on new technologies.
Funding line for market analysis and comparison on tax wavers of different sorts	Conduction of tax incentives feasibility study and three pilot projects in three different countries involving key stakeholders analysis for different tax wavers (like price reduction at the beginning or financial effects through life cycle of the purchased technology, etc.).

Thank you for your attention!

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