Global Challenges in Smart Logistics
- innovation driving supply chain control

Presenter

NOST Network
Agenda

- The Leading Edge Cluster Competition
- EffizienzCluster LogistikRuhr – an overview
- From ideas via research and development to products – selected topics
- Outlook
Leading-Edge Cluster Compition in Germany

Concept and selection criteria:

1. Strong scientific and economic starting position, high development potential
2. Strategy and management ensure sustainability of cluster
3. Significant financial support of 40 million euro over 5 years
4. Substantial contribution of industry (min. 50%)
5. Ambitious goals to establish the cluster in the international top league and to provide economic surplus
6. No pre-determination of topics, regional pooling along the value chain, high level, independent jury


>> Focus on sustainability, innovation and international
Procedure

**Application phase**
- *Call*: 3 months
- *Submission of Outlines*: 2 months
- *Jury*: Up to 15 applicants
- *Initial Selection Finalists*: 3 projects for the 1st funding phase
- *Submission of Strategies*: Up to 5 leading-edge clusters

**Funding phase**
- *Approval*: After approx. 2 years.
- *Progress reports*: With projects for 2nd phase
- *Jury decision*: On continuation of funding
- *2nd funding phase*

Project duration up to 5 years

Focus on sustainability, innovation and international
Three rounds in the Leading-Edge Cluster Competition

- Focus on sustainability, innovation and international
Summary

- Funding of up to 40 Million Euro for each cluster
- Up to 5 clusters funded in each round = 200 Million Euro funding
- 3 rounds = 600 Million Euro funding
- Always minimum of 50% invest of companies
- Total volume of minimum 1,2 billion Euro invest in R&D within the Leading Edge Cluster competition between 2007 and 2017
Focus on sustainability, innovation and international

Physical internet
- floating warehouses and factories
- prototype factory
- innovative «last mile»
- brand development and lobbying work

Water logistics
- energy logistics
- energy harvesting
- new sea routes
- innovative loading equipment
- city logistics for senior citizens

Document logistics
- opening up new, adjacent industries
- fabbing provider
- rapid prototyping production
- Geo-fencing

Securing the supply chain
- logistics for private households
- moving, shopping, mobility, etc.
- financial SCM
- total cost & value of ownership
- supply chain risk management

Managing diversity
- global recruitment
- trade transactions & auctions

Individual logistics service
- individual product design

Document logistics
- global recruitment

Mobile warehouses, inflatable hangars, trailers, etc.

Inflatable hangars, trailers, etc.

Prototype factory

Rapid prototyping production

Geo-fencing

Total cost & value of ownership

New sea routes

Individual product design

Managing diversity

Supply chain risk management

Financial SCM

Securing the supply chain

Global recruitment

Trade transactions & auctions

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Focus on sustainability, innovation and international
In the coming years it will be essential to resolve the contradiction between resource efficiency and individuality\textsuperscript{1}.

Creating tomorrow’s individuality with 75% of today’s resources.
Logistics Value Chain

Peripheral Players
- local authorities
- chambers, associations, clubs
- networks and collaborations
- cooperating clusters

Basic Technologies
- Hardware: loading and palletting technology; conveyancing, commissioning, and storage systems; packaging; packaging aids, etc.
- Software: warehouse and transportation management, ERP, SCM
- Innovative Key Technologies: RFID, sensor systems, bionics

Design of Logistics Services
- Innovative Logistics Services:
  - distribution of consumer goods
  - industrial contract logistics
  - terminal services
  - courier, express, and package services
  - haulage companies
  - basic national and international transportation/handling/storage services
  - other complex services

Application and Implementation
- Customers:
  - people
  - industry
  - trade (wholesale, retail, mail order)
  - transport providers (airports, sea ports, railroad stations, transport networks, Internet and IT Infrastructure)
  - waste management, recycling

Research & Development, Consulting

Education & Training, Qualification

Funding – venture capital, banks, insurance companies, public institutions

Focus on sustainability, innovation and international
Transform good ideas into good products

- Trendscouting, Studies
- Workshops focused on key issues
- Special Interest Groups
- Development of ideas and evaluation
- Innovation scan
- globalSCM
- Drawing up of concepts, product design
- Strategic and scientific consulting
- Project design
- Development of services and products
- Coordination of R&D activities
- Development of prototypes, tests
- Logistics Lab
- Market launch, diffusion
- Advisory services of funds provided under public development schemes
- Route of innovations in logistics
- Negotiating of business promotion activities
- Marketing
Focus on sustainability, innovation and international 120 Companies
12 Research Institutes and Universities
Key Topics // Application Areas

- Focus on the Environment
- Urban Supply
- Adaptable Logistics Systems
- Transportation Management
- Logistics-as-a-Service
- Design Competence

Management & Activation of Cluster Potentials
30 projects, 8 associated projects

Logistics-as-a-Service
- Supply Chain Design
- Supply Chain Execution
- Supply Chain Planning
- Service Design Studio

Urban supply
- Dynamics in Navigation
- eBase4Mobility
- ePOD@Home
- Homecare Services
- Urban Business Navigation
- Urban Retail Logistics

Transportation management
- Dynamische Konsolidierung
- Effizienz in logistischen Anlagen
- Integrated Air Cargo Hub
- Minimalinvasive Baumaßnahmen
- Multimodal Promotion
- Organisatorische Innovationen in Logistik-Netzwerken
- Safe Networks for Logistics

Adaptable logistics systems
- smaRTI – smart reusable transport items
- Tracing intelligenter LogistikObjekte

Focus on environment
- Entwicklung eines neuartigen Regalbediengerätes auf Basis der Stewart-Gough-Plattform
- Green Logistics
- Ressourceneffiziente Instandhaltungslogistik
- Sustainable Sourcing Excellence
- Tray Cycling

Logistics design competences
- Integriertes CSR-Management in Logistiknetzwerken
- EBS-Fraunhofer Supply Chain School
- eQuaL 2.0 - e-Qualifizierung für effiziente Logistikprozesse
- Universitäre wissenschaftliche Weiterbildung in der Logistik

Activation of cluster potentials
- Competitiveness Monitor

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Research Project Multimodal Promotion

Target and Methods

- Development of a Web 2.0 tool for the simple design of multimodal door-to-door transport chains without previous knowledge about the combined transport.
- Implementation of a company-wide consolidation of transport streams, including drayage and haulage planning.
- Bundling small quantities into large volumes.
- Improvements of sustainability and efficiency.

Trimodal D2D transport chain design

Company-wide consolidation

Evaluation of alternatives (cost, time, CO₂)
Platform main functions

- Interface between operators and users
- Schedule check
- Timetable formation
- Local traffic planning

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Current prototype covering Germany, France, Netherlands, Belgium
Interim Results

- web interface to facilitate „modal-choice“ by entering transport data
  » load unit short description
  » origin-destination-information
  » time window
- required data is already available from transport orders – routing takes in account
  » handling times in terminals
  » time slots
  » schedules from rail and barge transport
- checking „shift potential“ for shippers with no specific „combined transport“ knowledge possible
DISMOD® IML toolkit for logistics planning
Contribution of transport sector to total emissions of main air pollutants in 2009 (EEA-32)\(^{(1)}\)

- SO\(_x\)
  - Non-transport sectors: 83%
  - Transport: 17%
  - Transportation sectors contribute 14% to SO\(_x\) emissions.

- PM\(_{2.5}\)
  - Non-transport sectors: 75%
  - Transport: 25%
  - Transportation sectors contribute 11% to PM\(_{2.5}\) emissions.

\(^{(1)}\) TERM 2009
Project Green Logistics

- Database and principles for ecological assessment of logistics
  - Key figures, methods, reference processes and technologies, procedures, mathematical model, balance scopes, ...

**Products**

- Certification system
- Assessment kit with standard modules

**Realization**

- Low carbon logistics network
- Low carbon logistics real estate
- Low carbon intralogistics

**Result / Benefit**

- Reduction of CO₂ emissions
- Green revolution within logistics

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2014
EC projects finished, product development phase starts

2015
BMBF programme Morgenstadt // Urban Mobility

2015
European Research Center for Logistics with the five best of class European institutes

2016
Logistics Campus Dortmund facilities completed

2016
KIC Smart Manufacturing and Logistics

>> Focus on sustainability, innovation and international
Vision 2020: European Research Center for Logistics

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Thank you very much!
In case of further questions

Please contact our NOST offices abroad directly, or through the central office:
- internet: www.IAnetwerk.nl
- telephone: + 31 88 602 5021
- e-mail: ianetwerk@agentschapnl.nl

or contact this speaker directly:
- telephone: +49 231 9743 605
- e-mail: thorsten.huelsmann@effizienzcluster.de