



LANDESVERTEIDIGUNGSKADEMIE



Strategic Foresight Analysis Workshop-Helsinki

officers' club "Katajanokan Kasino", Helsinki, Finland
21-22 October, 2015

Emerging Risks and Disruptive Trends in (Global) Supply Chain Networks

Presenter:

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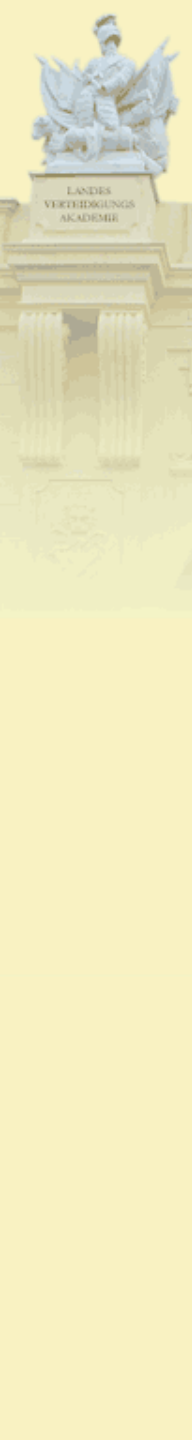
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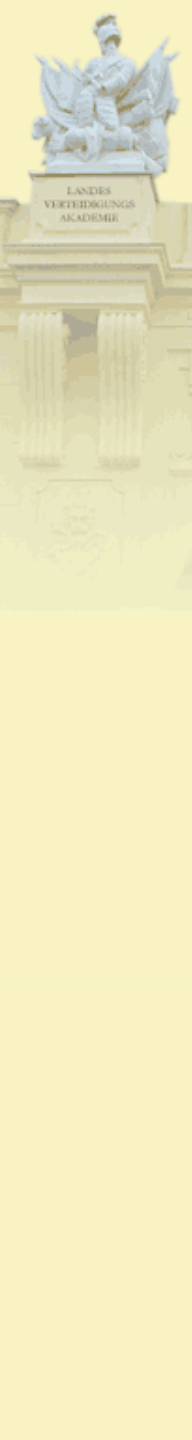


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Emerging Risks and Disruptive Trends in (Global) Supply Chain Networks

Agenda:

- Disruptive trends and emerging risks
- Threats and fear as driver for future conflicts
 - Future threats and developments in cyber security
 - Environmental threats and risks, that might cause future conflicts
 - Future public infrastructure and governance
- Global supply chain networks
 - information & communication networks,
 - finance-networks, crypto-currencies,
 - resource networks,
 - Physical internet
- Capability development options
 - possible options for solutions



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Emerging Risks and Disruptive Trends in (Global) Supply Chain Networks

Threats and fear as driver for future conflicts

Typical topics in future threat discussions in industrialized countries

- Terrorist attacks
- Cyber attacks
- Espionage
- Organized crime
- Sound pollution
- Light pollution
- High tech threats
- CBRN
- Financial market instability
- New technology discussions
- Instability in resource markets



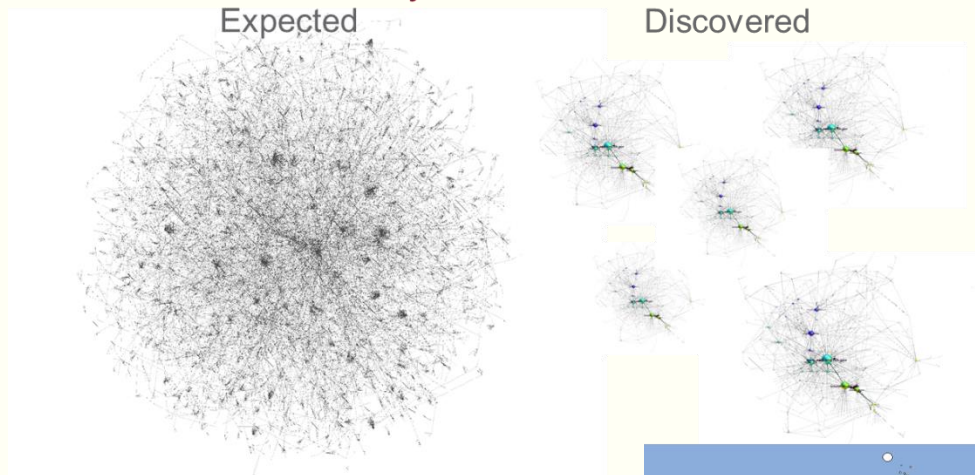
Typical topics in future threat discussions in non industrialized countries

- Environmental damage
- High technology waste
- Climate threats
- Extreme weather
- Resources scarcity

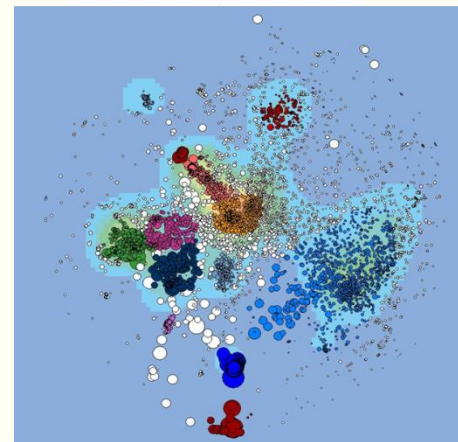


Scanning the internet with the threat identification agent (TIA)

Social network analysis: Network is not interconnected



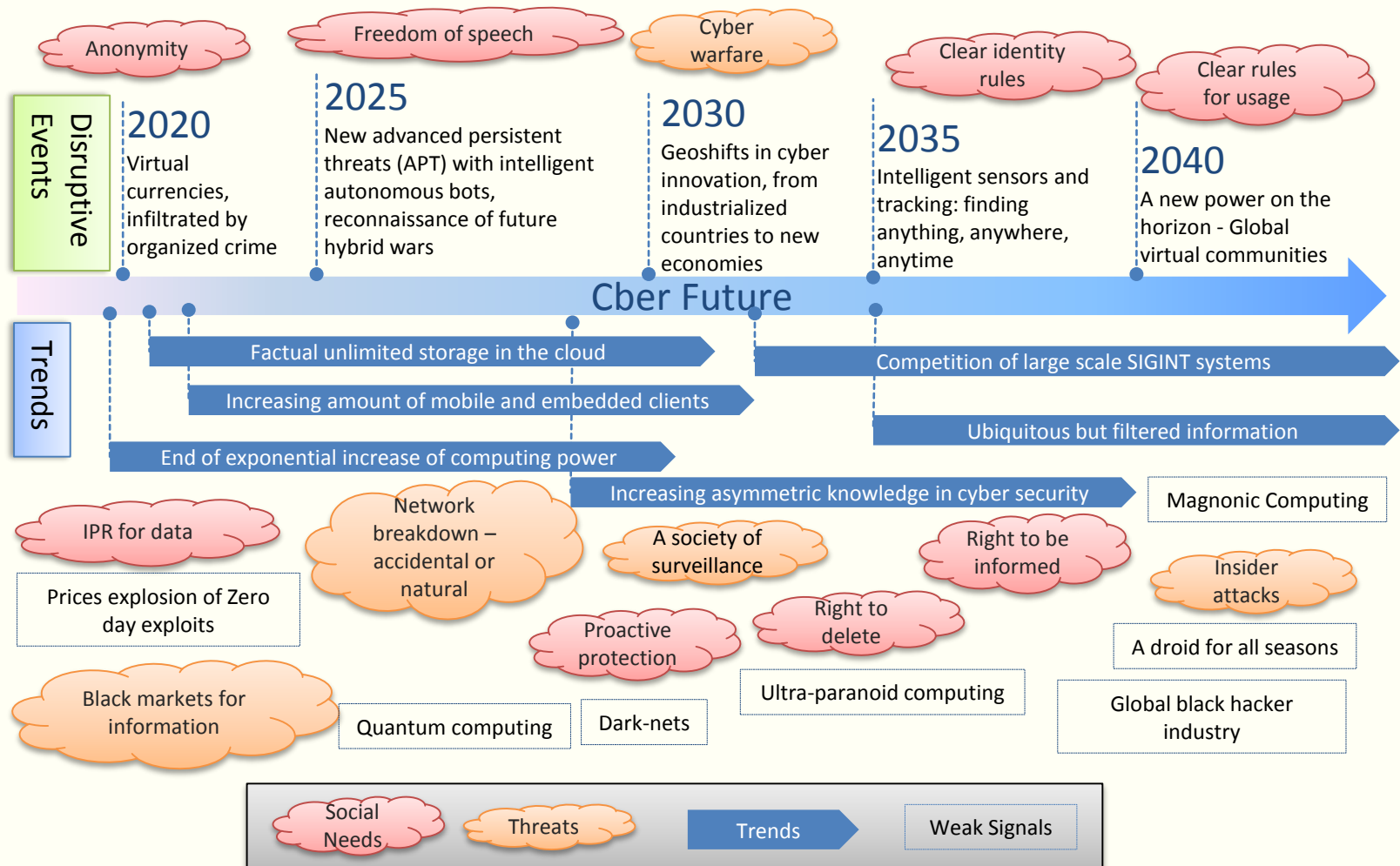
High level cluster analysis



- Ocean acidification
- American Conservatives
- Aviation
- Anarchists
- Cyber threats
- Nuclear weapons
- Rainforest destruction
- UAV
- Books on future threats
- Pentagon Library

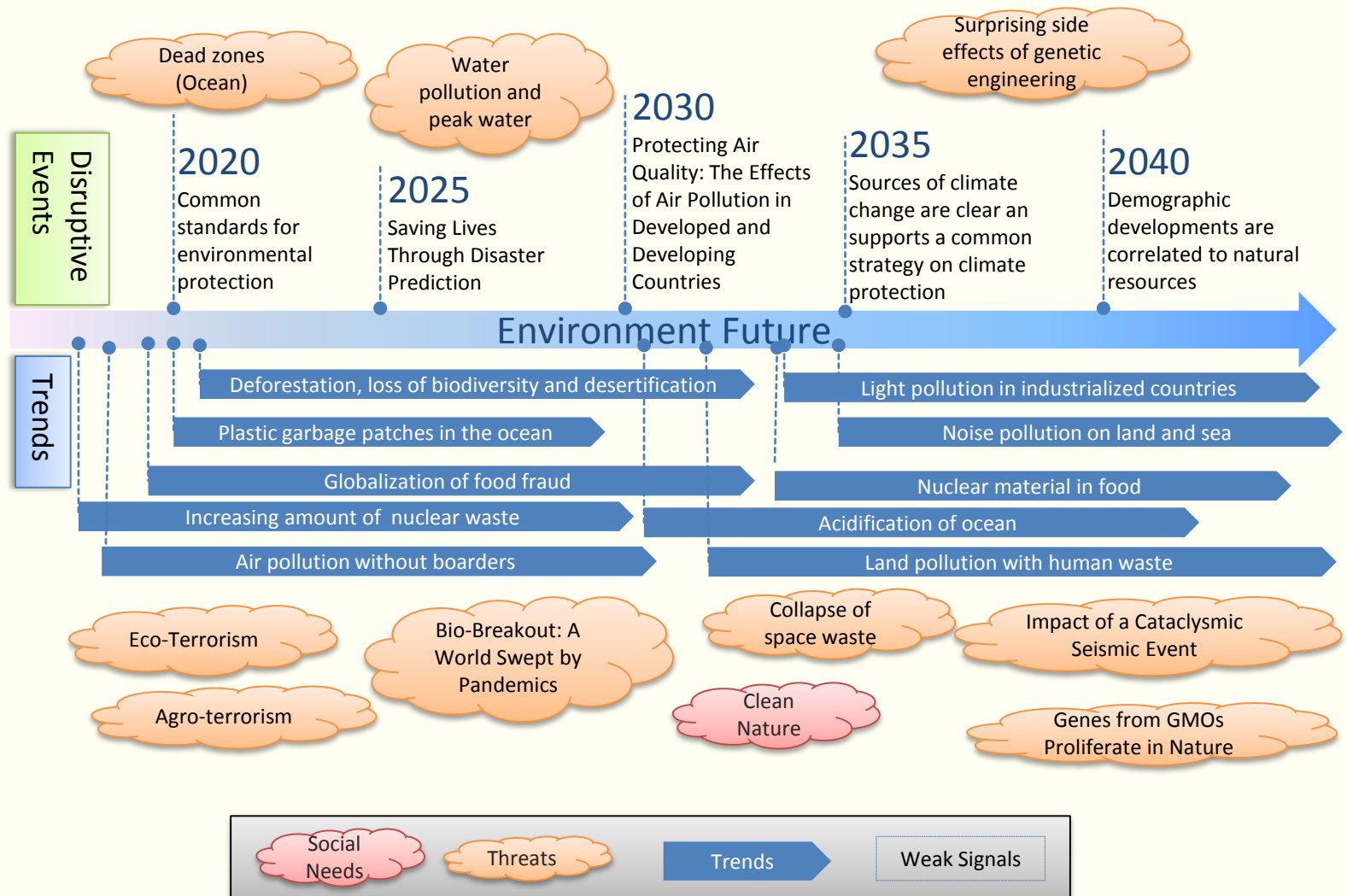


Future threats and developments in cyber security





Environmental threats and risks, that might cause future conflicts

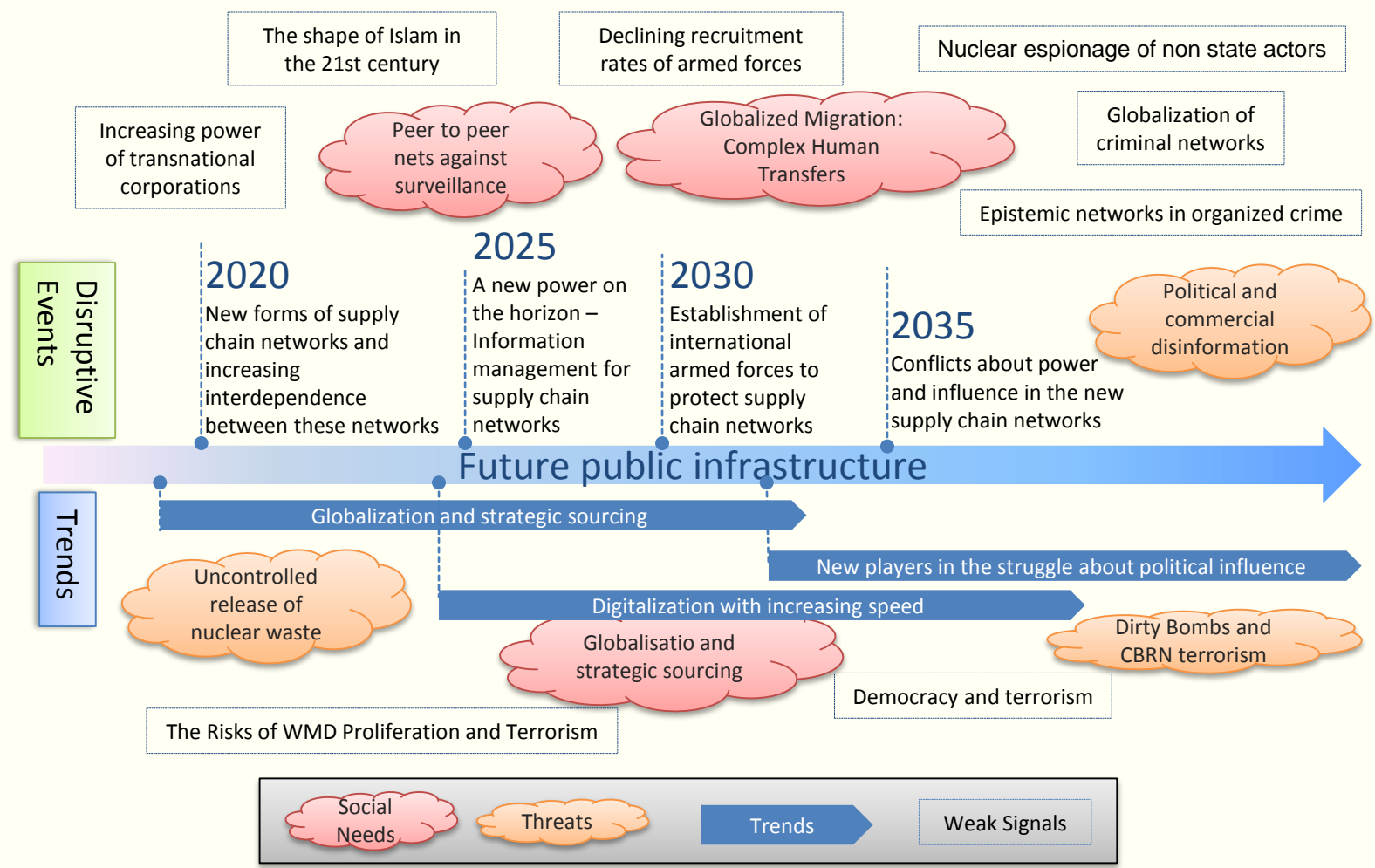


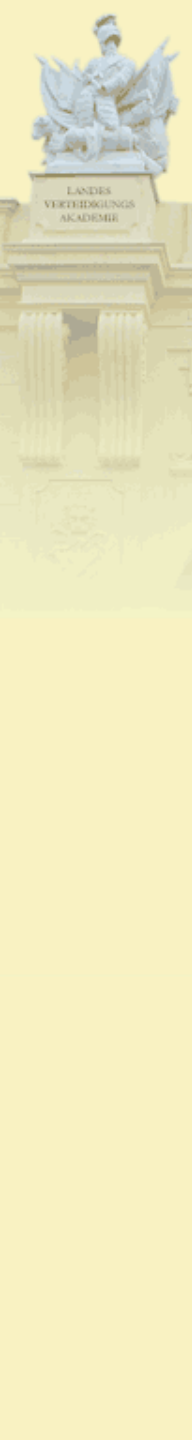


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Future public infrastructure and governance





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Supply Chain Security:

(FOCUS: Foresight Security Scenarios: Mapping Research to a Comprehensive Approach to Exogenous EU Roles, EU-FP 7 programme)

The “threat side of the Supply chain security equation” – including exogenous threats to EU - **is not well covered** in the literature today.

Instead, most of the literature refers vaguely to “terrorism threat” or “cargo crime” as main reasons behind Supply chain security programs, standards and regulations.

(see D5.1 www.focusproject.eu, page 99, point 8.3, Ending Date: 31/03/2013)

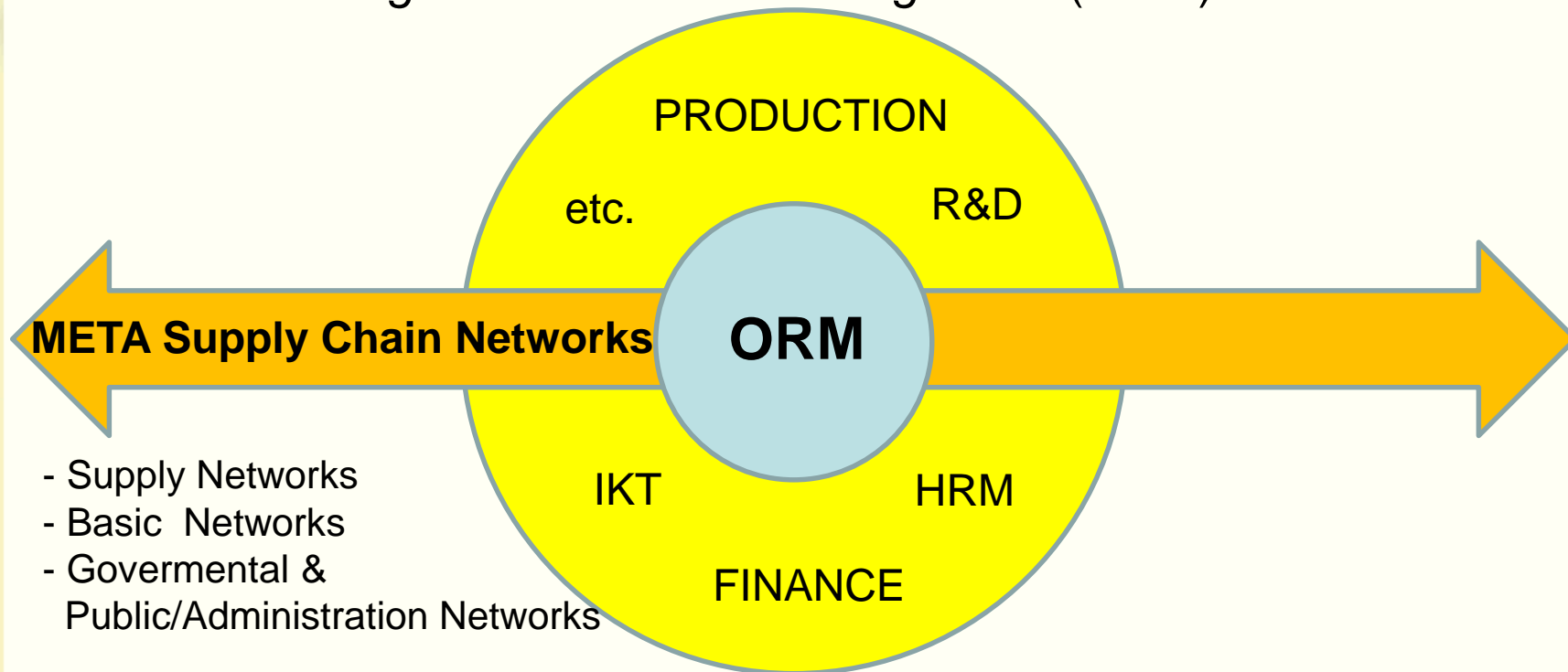


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Meta Supply Chain Model

Organisational Risk Management (ORM)



relation: Organisation – Supply Chain Networks – ORM, J.Goellner



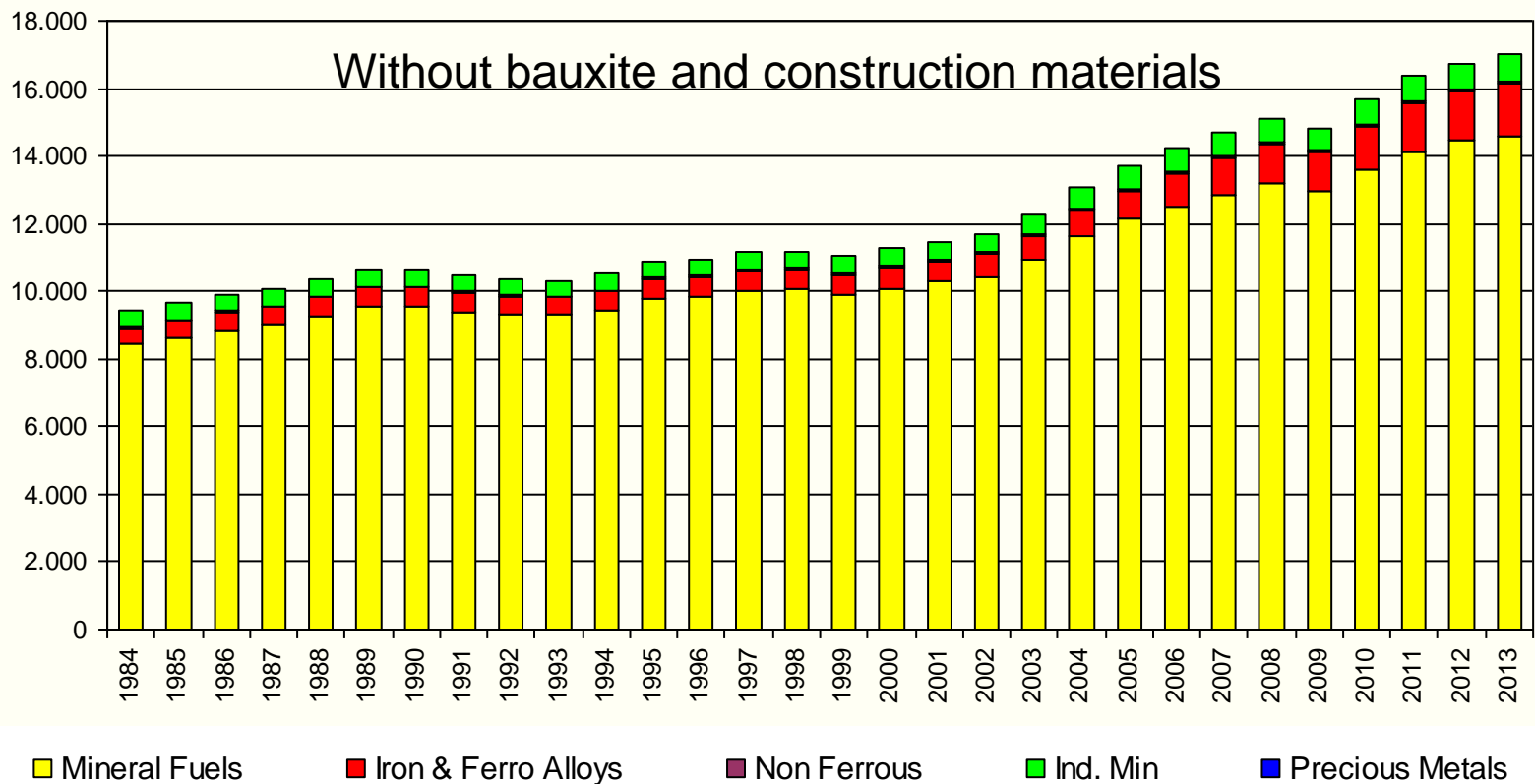
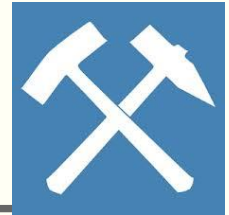
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Description of (Global) Supply Chain Networks:

Supply Networks	<p>e.g.:</p> <ul style="list-style-type: none">• Financial Networks• Resource/Raw Material Networks (criticality)• Food Supply Network• Water Supply Network• etc.	Governmental & Public-/Administration Networks
Basic Networks	<ul style="list-style-type: none">• Transport/Traffic-Networks<ul style="list-style-type: none">– (Air, Road, Railway, Water)• ICT-Networks (+/-: Smart Grids)• Energy Networks (+/-: Smart Grids)	



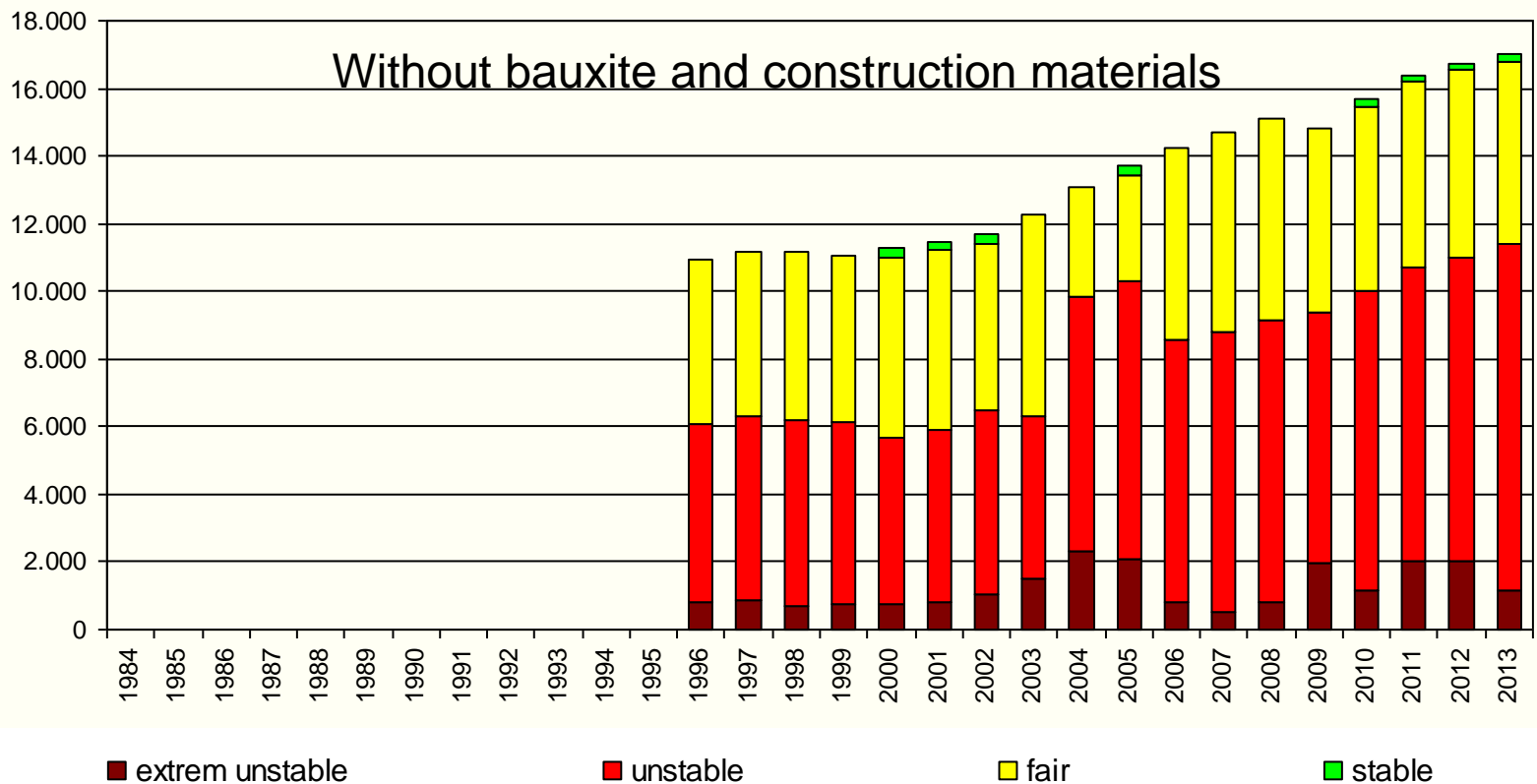
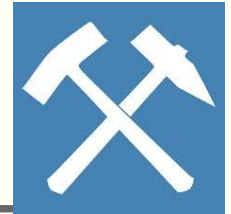
World Mining Production by groups of minerals



Source: WORLD MINING DATA 2015; Prof. Weber, Montan University Leoben



World Mining Production by political stability of the producer countries



Source: WORLD MINING DATA 2015; Prof. Weber, Montan University Leoben

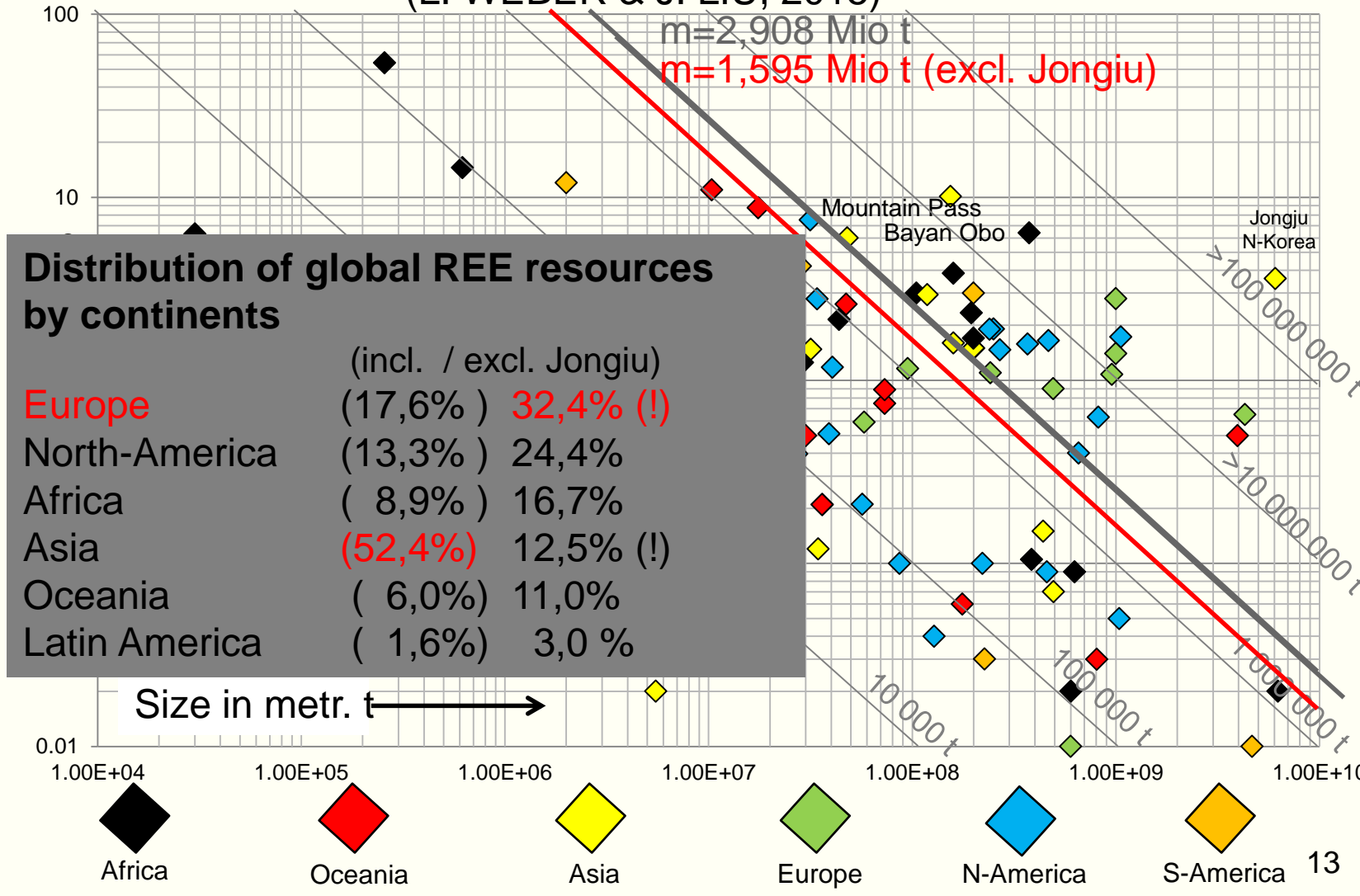


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REE-Resources by continents

Measured, indicated and inferred resources in metr. t
(L. WEBER & J. LIU, 2015)





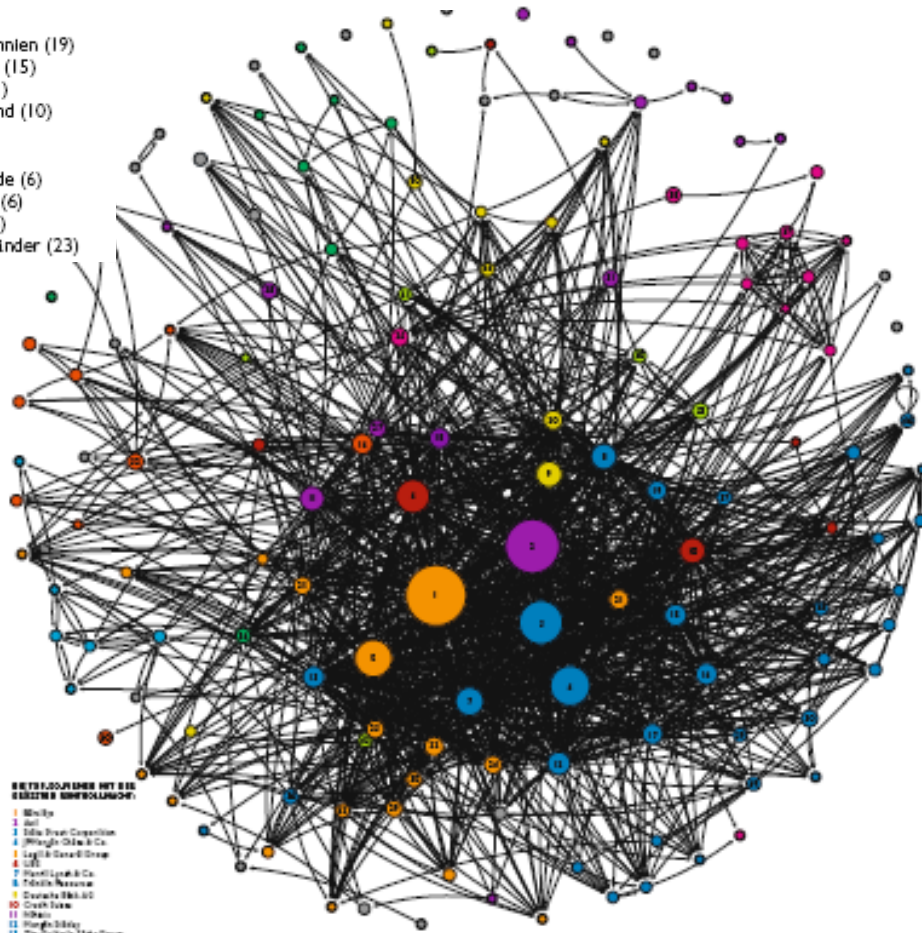
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Network Analysis of Banking & Finance Networks

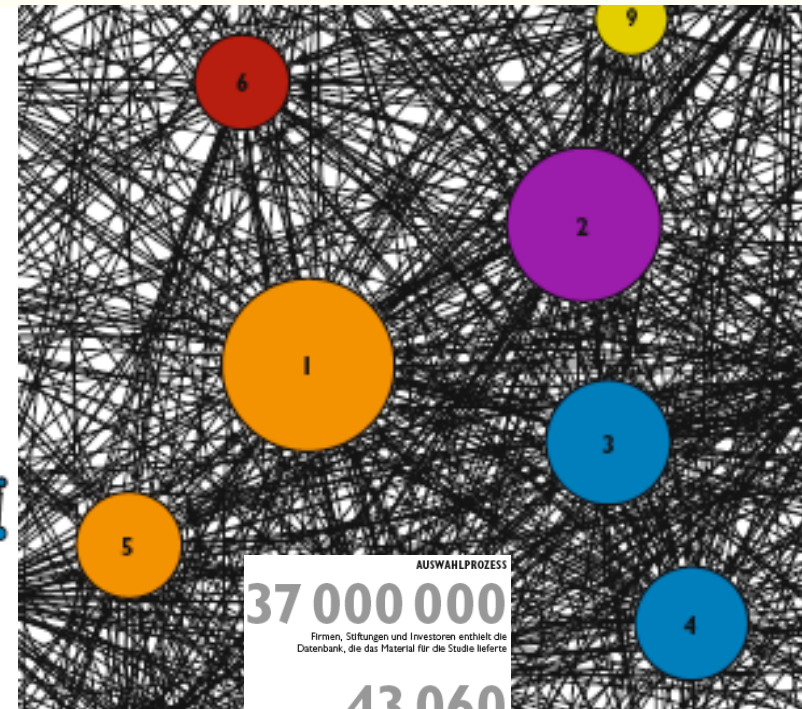
37 GRAFIK 31. Mai 2012
DIE ZEIT N° 23

LAND

- USA (33)
- Großbritannien (19)
- Frankreich (15)
- Kanada (11)
- Deutschland (10)
- Japan (10)
- Italien (8)
- Niederlande (6)
- Schweden (6)
- Schweiz (6)
- sonstige Länder (23)



- DEUTSCHLANDER MIT DEN GRÖSSTEN KONTROLLANTEINTEILEN:
1. Mercedes-Benz
 2. BMW
 3. Volkswagen Group
 4. SAP
 5. Linde AG
 6. Bosch
 7. Henkel AG & Co.
 8. Adidas Group
 9. Deutsche Telekom
 10. Allianz SE
 11. BASF
 12. Bayer AG
 13. ThyssenKrupp AG



DIE TOP-50-FIRMEN MIT GRÖSSTEN KONTROLLM

- 1 Barclays
- 2 Axa
- 3 State Street Corporation
- 4 JPMorgan Chase & Co.
- 5 Legal & General Group
- 6 UBS
- 7 Merrill Lynch & Co.

AUSWAHLPROZESS
37 000 000
Firmen, Stiftungen und Investoren enthielt die Datenbank, die das Material für die Studie lieferte

43 060
transnationale Unternehmen operieren in mindestens zwei Ländern

1318

Firmen bilden den Kern des Netzwerks und haben im Durchschnitt 20 Beteiligungen

147

Mitglieder der »Superzelle« im Inneren des Netzwerks kontrollieren fast 40 Prozent des Vermögens aller transnationalen Firmen

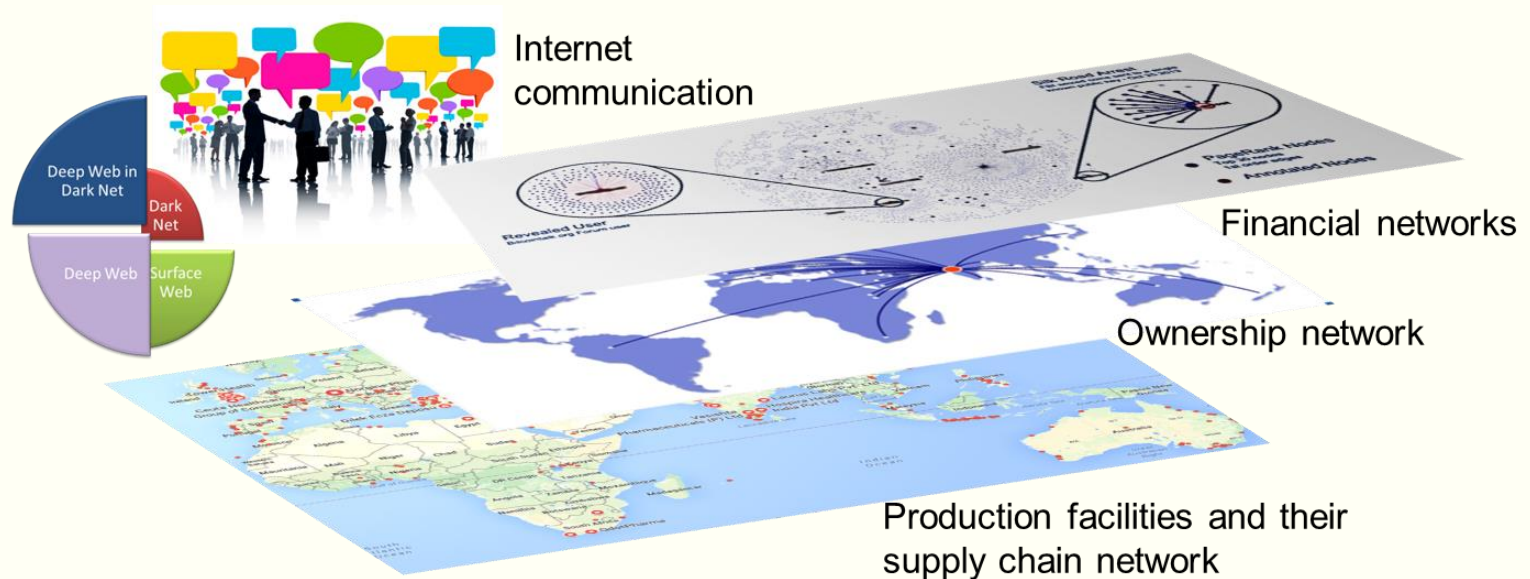
Source:
Institut für
Systemgestaltung,
ETH Zürich

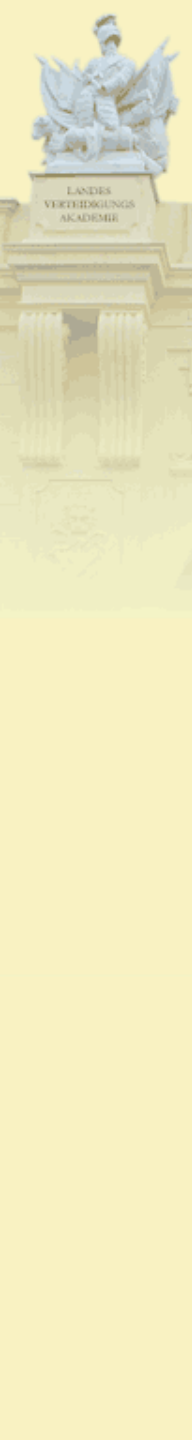


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Crypto currencies as disruptive trend for international supply chain networks



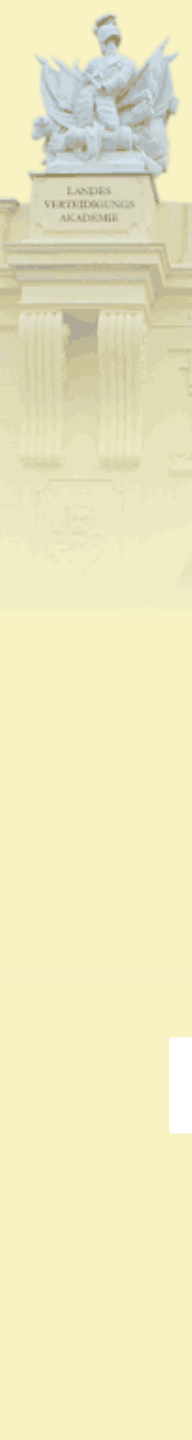


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Physical Internet (PI):

- Physical encapsulation
 - No direct "grab" the products
 - Standardised encapsulation
 - Analogy to the digital internet
- Digital encapsulation
 - Smart boxes/containers
- Interfaces for universal networking
 - **PI-Container (FP 7-Project MODULUSHCA)**
 - PI-forklift, -conveyors, -warehouse
 - PI-protocol for optimized universal networking



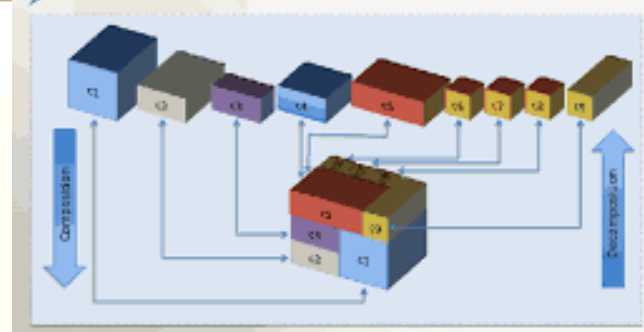
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Physical Internet: FP 7-Project MODULUSHCA Supply Chain Application



Enabled by Standardized Modular Containers



New Concept for logistics operations:
<http://www.modulushca.eu>

iti Institut für Technische Logistik

Erste Physical Internet-Box

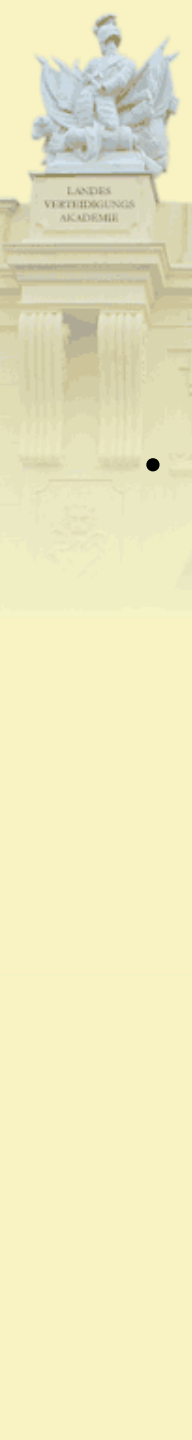
Umsetzung
Verbindung erfolgt über Deckel/Boden

- Modular
- Gesicherte feste Verbindung
- Hebel zum Verbinden und Lösen (Automatisierung möglich)

Eckdaten

KPI - Modulushca Box	
Abmessungen außen [in mm]	300x150x300
Abmessungen innen [in mm]	270x120x270
Anzahl der Volumen	74,25%
Gewicht	2,5kg

Funktioneller Deckel
Kleiner modularer Abstand
Funktioneller Boden

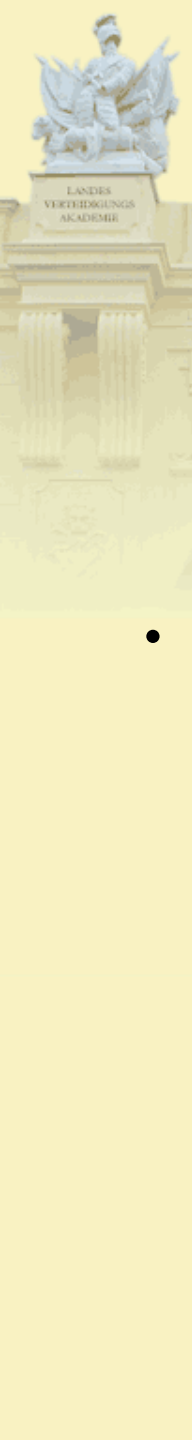


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Capability development options:

- **Development of a monitoring solution:**
 - „Supply Chain Monitoring Solution“,
 - e.g. in analogy to the first guideline of Working Group: Supply Chain Risk Management of the Risk Management Association, Munich, Germany (2013-2015) (<https://www.rma-ev.org/Veroeffentlichung-zum-Download.696.0.html>)
 - „Strategic situation awareness center for permanently global analysis of strategic resource/raw material-SRA“ (www.kiras.at, 2014-12/2015)
 - „Strategic situation awareness center for permanently global analysis of cyber security“,
 - e.g. in analogy to the „**Cyber Documentation and Research Center**“, Dept. of Central Documentation & Information, National Defence Academy of the Austrian MoD, (10/2014-ongoing)



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Capability development options:

- **Design or re-design the supply chain network structures**
 - Peer to Peer structure (decentralized) vs centralized managed supply chain network,
 - remark: but loss of state sovereignty because of increasing peer to peer structure of supply chain network.
 - How to protect and attack decentralized supply chain network?



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Thank you for your attention !



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For further information, question and specific interest,
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