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Critical (Information) Infrastructure Protection

Towards a common European C(I)IP approach

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Background

- Eric Luiijf MSc.
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Agenda

- European Critical Infrastructure
  - definition
  - complexity
    - example: Dutch critical infrastructure
- Towards a common European C(I)IP approach

Critical Infrastructures (CIs)

EU COM(2004)702 Final

- Physical and information technology facilities, networks, services and assets
- that, if disrupted or destroyed, have serious impact on
  - health
  - safety
  - security
  - economic well-being
  - effective functioning of governments

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Critical Infrastructures in general

- Serious impact?
  - metrics?
    - Netherlands: five properties
  - at which scale?
    - at local level more critical services
    - at larger scale less critical services
- Top-5 critical sectors
  - **energy**
  - telecommunications
  - transport
  - human needs (drinking water, food, health services)
  - government services

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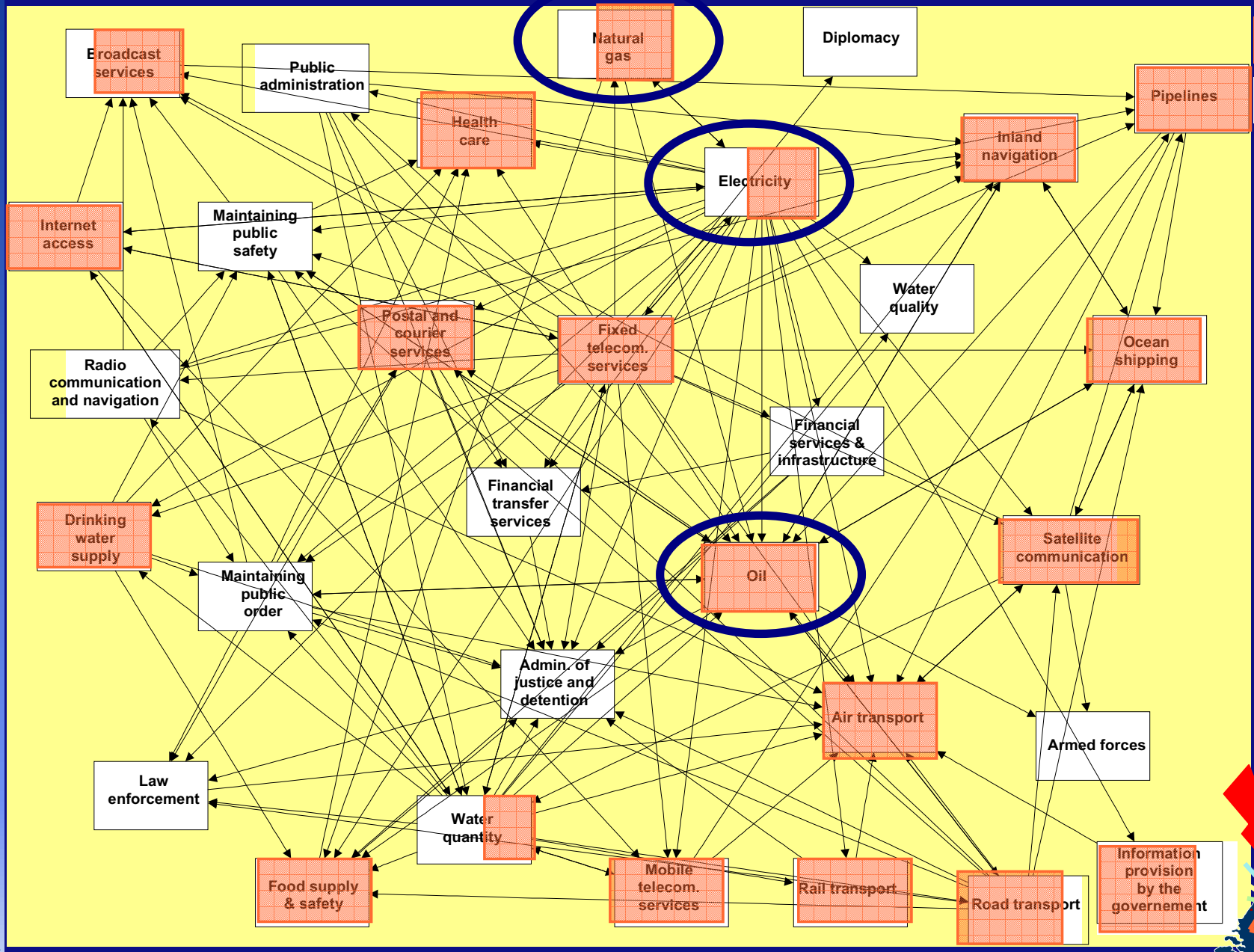
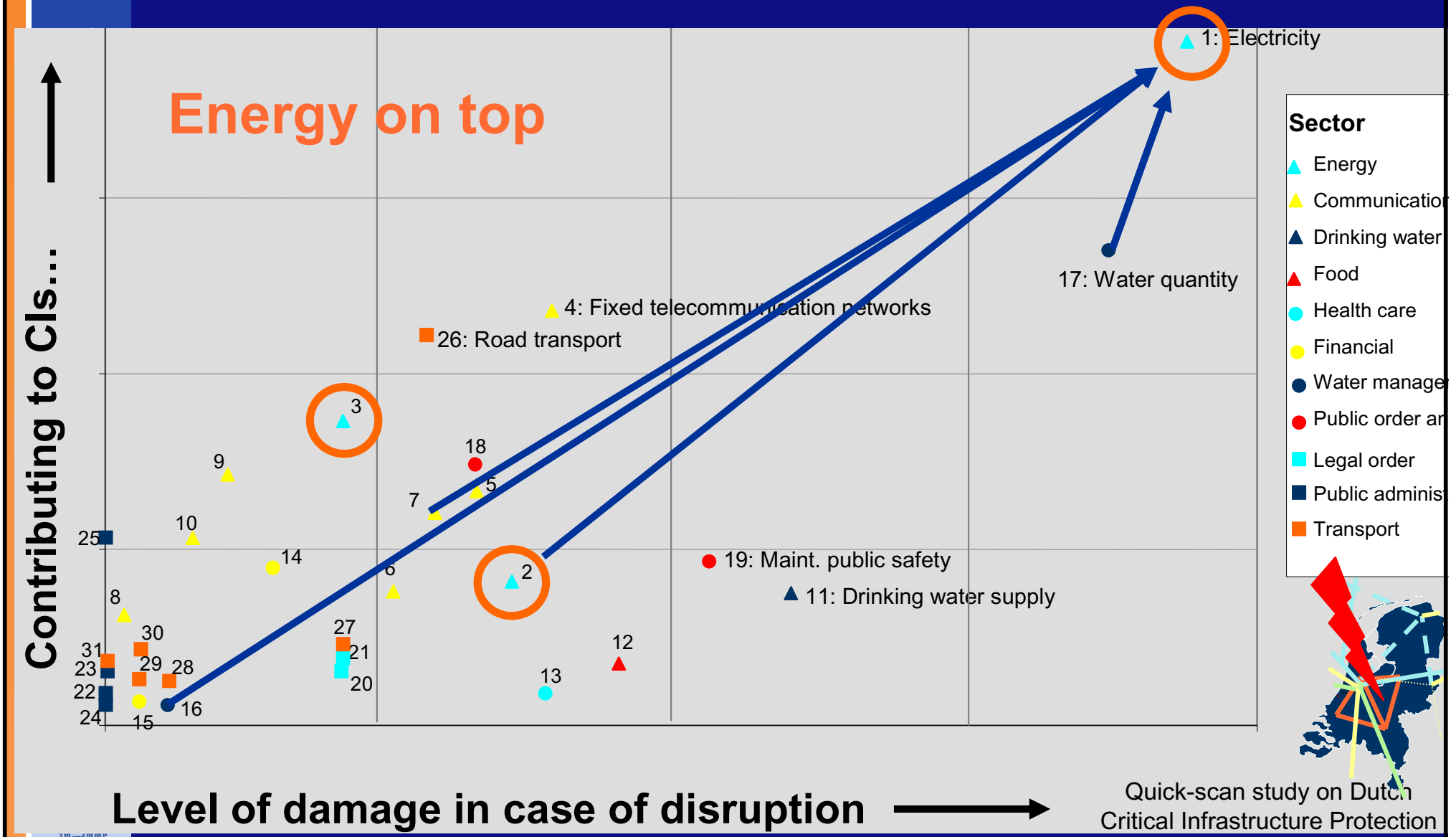
European Union Critical Infrastructure (ECI)

- Serious impact to multiple European Union nations
  - notion of national responsibilities and sovereignty
- Consists of
  - common natural infrastructure
  - supranational technical infrastructure
  - geopolitical dependencies
  - EU political-organisational infrastructure

Dutch CI complex, interdependent & largely private



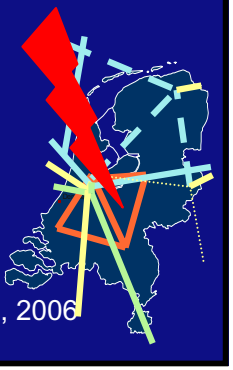
Interdependency and potential damage



Quick-scan study on Dutch Critical Infrastructure Protection

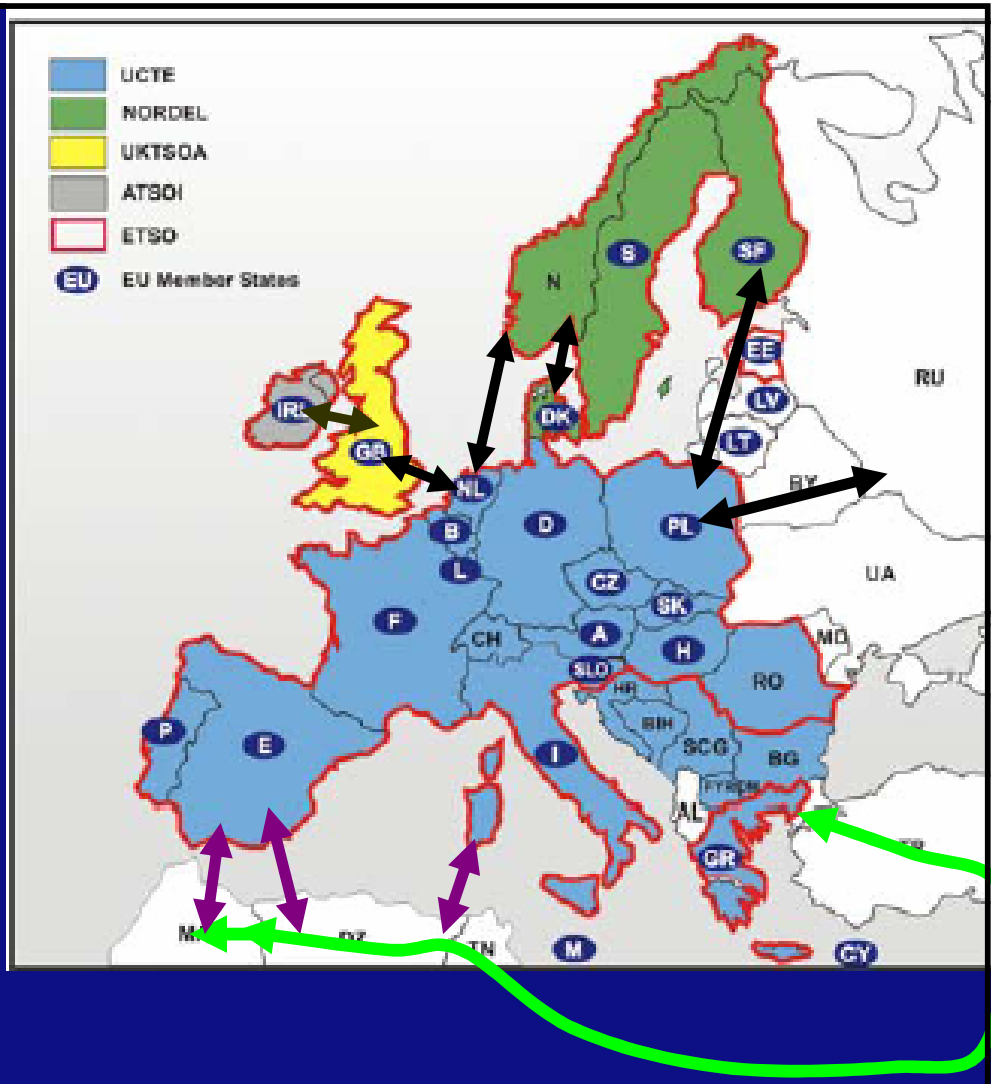
Dutch (inter)dependency findings

- Critical infrastructure owners
  - know most of their dependencies, but not all !
  - do not know
    - low level technical dependencies
    - their most important dependent critical clients
- Large differences between critical services
  - disruption characteristics (seconds .. weeks)
  - recovery characteristics (minutes .. years)
  - incident time-of-day and season effects



European power grid

- Largely interconnected
  - 30+ national grids
  - “independent” areas
  - integration new EU MS
  - new connections expected
    ➔Euro-N.Africa grid



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European power grid (2)

- Reliability
  - citizens expect max. 2-3 minutes power outage/year
  - black-outs Sweden–Denmark and Italy (50M people)
- Instabilities
  - market instead of public commodity
  - nearing system load limits
  - limited cross-border capacity
    - long-term planning cycles
  - dynamic impact wind energy
  - asymmetric distribution of generation types
  - cyber vulnerabilities (SCADA)
- …

European Union power - C(I)IP activities

- EU CEIP workshops
  - power generation
    - improper governance models
    - complex set of (inter)dependencies
  - power transmission
    - complex international operations
    - N-1 criterion has flaws
  - ICT-dependencies and weaknesses
    - GPS, spot market, ..
    - open SCADA protocols on top of COTS connected to Internet

- ➔ EU concluded C(I)IP is a necessity
  CIP is a complex multi-disciplinary problem

EU Gas and Oil

- Infrastructure
  - pipelines; cleaning facilities
  - harbour facilities for LNG
  - refineries
- Main sources
  - North Sea, EU mainland
  - Russia (gas, oil)
  - North Africa (LNG, oil)
  - Middle-East
- Complex political dependencies
  - EU 25 nations
  - non-EU transport nations can close the tap

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Common EU approaches to C(I)IP

- EU Directorate Justice, Freedom and Security
  - European Programme on CIP (EPCIP)
    - all hazards
    - towards co-ordination and common approaches (green paper)
    - building CIP framework
    - embraces EU DG Transport & Energy projects
  - challenges
    - information sharing sensitive data
      - public-private
      - internationally
    - embed the National CI's taking into account different speeds

Common EU R&D

- EU Directorate Justice, Freedom and Security
  - Preparatory Action on Security Research (PASR)
    - 15 M€ /year; ~12 projects
  - towards a European Research Area Security
    - 250 M€ /year
  - European Security Research Advisory Board (ESRAB)
- EU DG Industry
  - framework programmes include information assurance in CIP

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European C[E,I]IP R&D projects

- VITA - Vital Infrastructure Threats and Assurance (PASR)
  - threat taxonomy for CIP (new approach)
  - integration of several methodologies
- CI²RCO - Critical Information Infrastructure Research Co-ordination
  - shape the European CIIP research area
  - currently: scattered initiatives, not stakeholder-driven
- IRRIIS - Integrated Risk Reduction of Information Infra Systems
  - aim secure middle-ware components to reduce cascading risk
    - process control in energy sector
    - telecommunication

Summary

- C[E,I]IP is more than just a technological problem to solve
  - many R&D challenges, ranging from technological to policy issues
  - requires a co-ordinated multi-disciplinary international approach
  - targeting all hazards
  - need both short-term practical as fundamental R&D approaches
- EU direction
  - both capability-based approach and long-term research





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Thank you!

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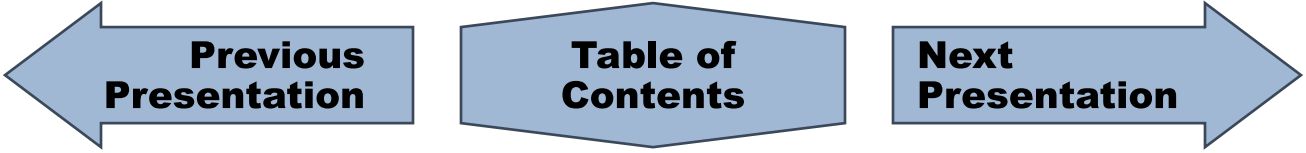
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