

# The impact of unbundling on the information architecture behind commercial and technical functions in the energy value chain

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# Overview

- Extent and scope
- Institutions and information architecture
- Unbundling regimes and actors in utility land
- Flows and functions
- Institutional design
- Analysis NL situation
- Conclusions and recommendations

*Novel and innovative solutions, recommendations on required information technology  
Economic benefits by reduction of transaction costs and more effective/transparent institutional arrangements  
Adapted business architectures leading to adapted modes of organisation in the energy market*

## Extent and scope of study

- Impact of unbundling on the information architecture, technical and commercial functions, criticality, possible institutional arrangements, scope NL energy market
- Influence of decentral generation, electric automotive on the information architecture, perspective smart grid concept, evaluation model measure and test performance of technical and commercial functions, certain mode of organisation of the energy market, transaction cost economics
- Evaluation information architecture EU level @ different unbundling regimes, different modes of organisation, Belgium, Denmark, Germany and the UK
- Standardisation information architecture, economies of scale, scope, system and intelligence, institutional design, information code, supra national level

*In this session we will focus on stage 1: unbundling, information architecture, functions and institutional arrangements*

# Institutions and information architecture

Institution	Actor
Market	Utilities, market players, manufacturers, service providers, integrators
Legislation	Policy makers, regulators, government (supra national, national, provincial, municipal)
Society	Customers and end users; wholesale, B2B, B2C
Research & development	Development labs, academia, consultants

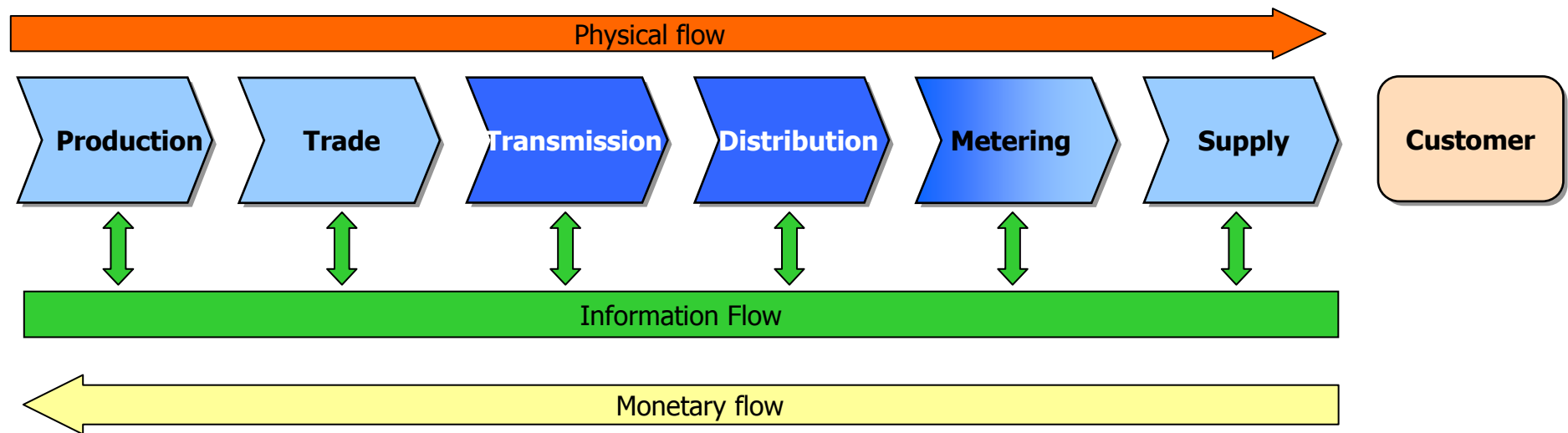
- Information architecture: discipline of expressing a model or concept of information used in energy related activities that require explicit details of complex systems
- library systems for energy related information (client registries, network connection registries, meter- and meter data registries, trade registries and the regulation registries), content management systems, web interface development, user interactions, database development, programming, technical writing, enterprise architecture, and critical system software design

# Unbundling regimes: OU, ISO, and ITO

	<b>Ownership Unbundling</b>	<b>Independent System Operator</b>	<b>Independent Transmission Operator</b>
TSO Regulated domain	Ownership rights Economic rights Decision rights	Economic rights Decision rights	Decision rights
Production/Delivery Non-regulated domain		Ownership rights	Ownership rights Economic rights
Regulatory effort and complexity	Low	Medium	High

*Regulatory effort pertains to the performance of functions, unbundling regime in essence independent of the information architecture*

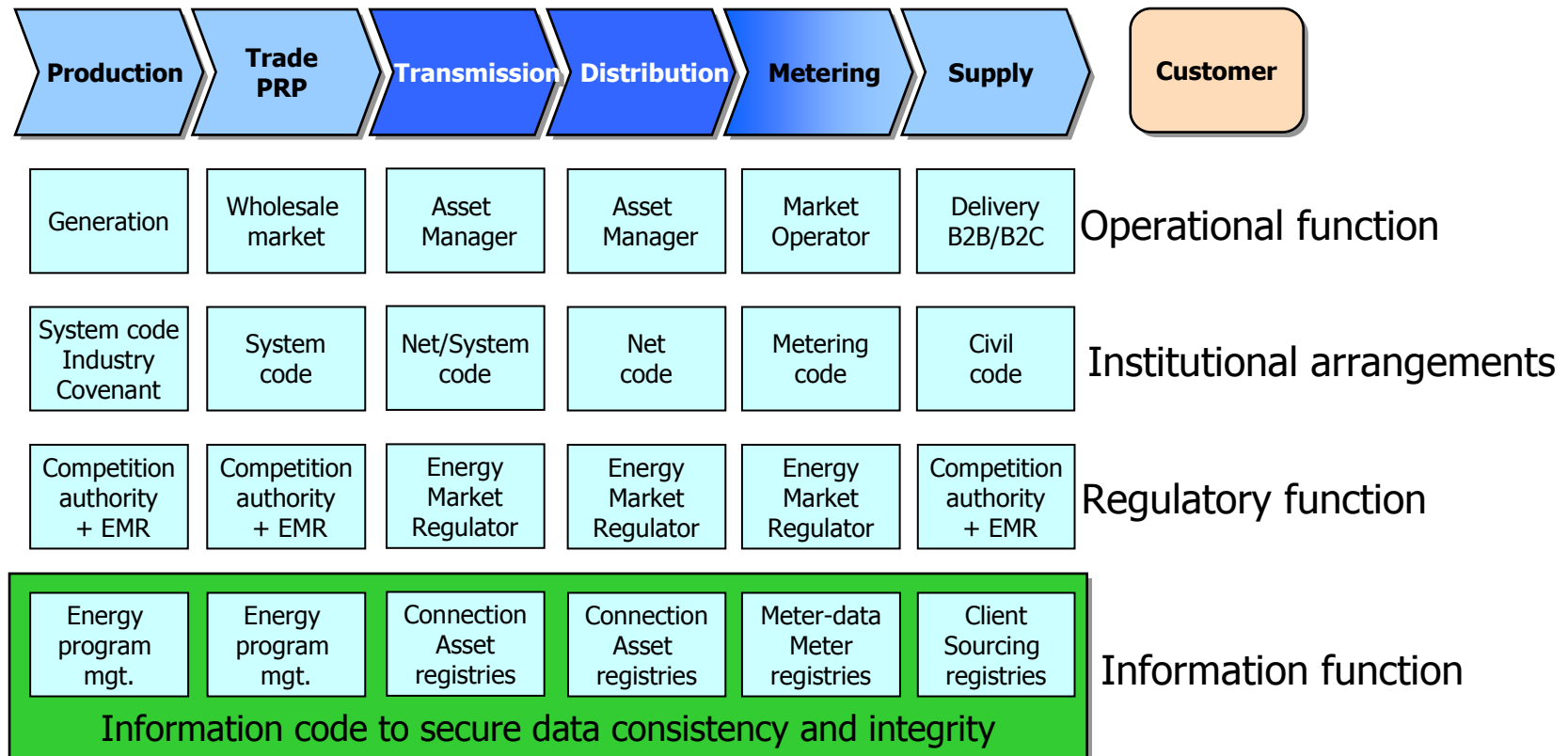
# The main flows in the value chain



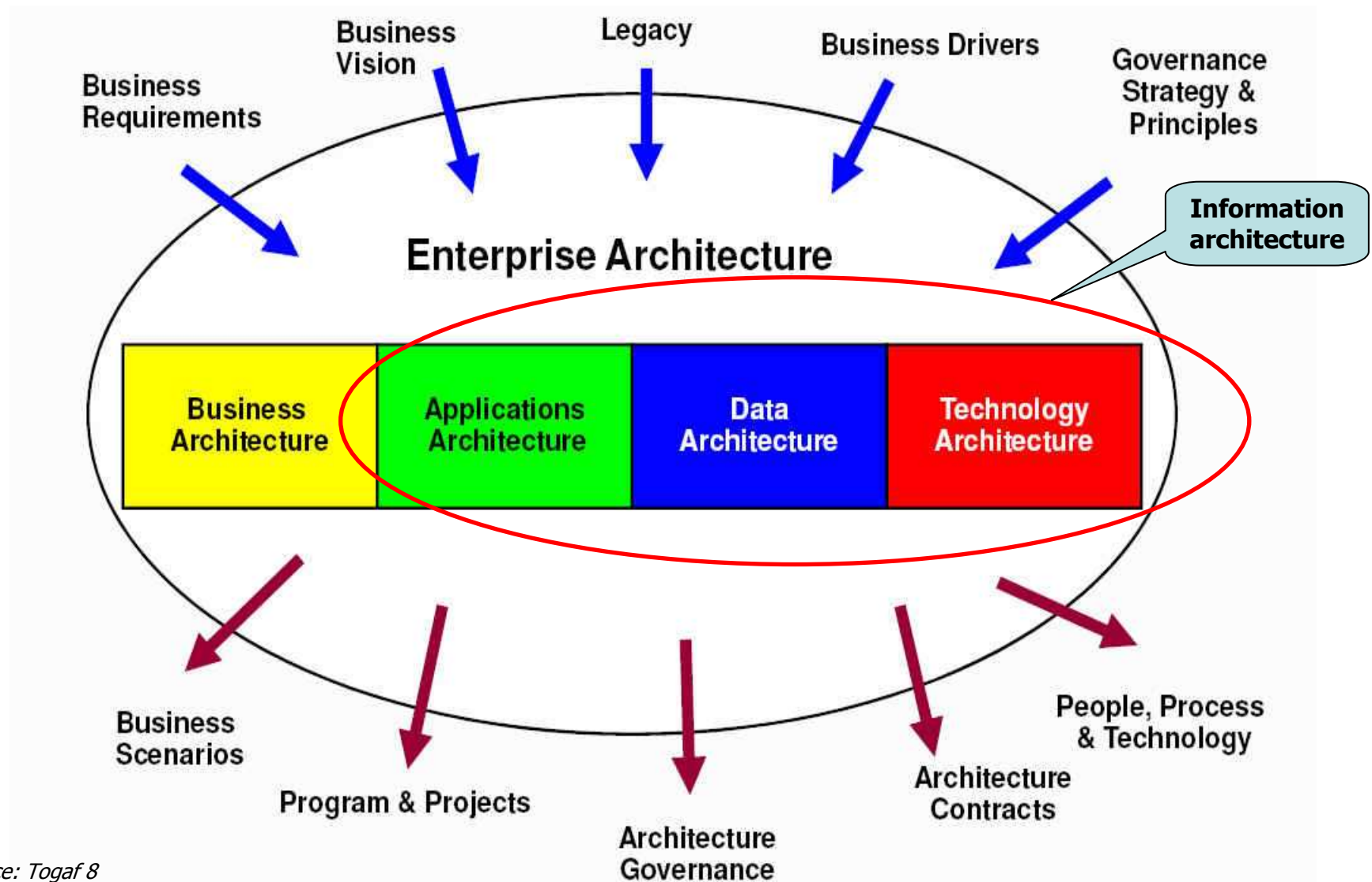
# Functions

	Critical	Non-critical	Institutional arrangement	Objective
Technical	Balancing Monitoring Allocation Unit commitment ... PRP? Shipper?	Maintenance Network studies ...	Technical codes	Public value security of supply
Commercial	Billing Allocation Delivery control ...	Reconciliation Moving Closure ...	Information code Competition law	Market objective Shareholder value

# Possible institutional design

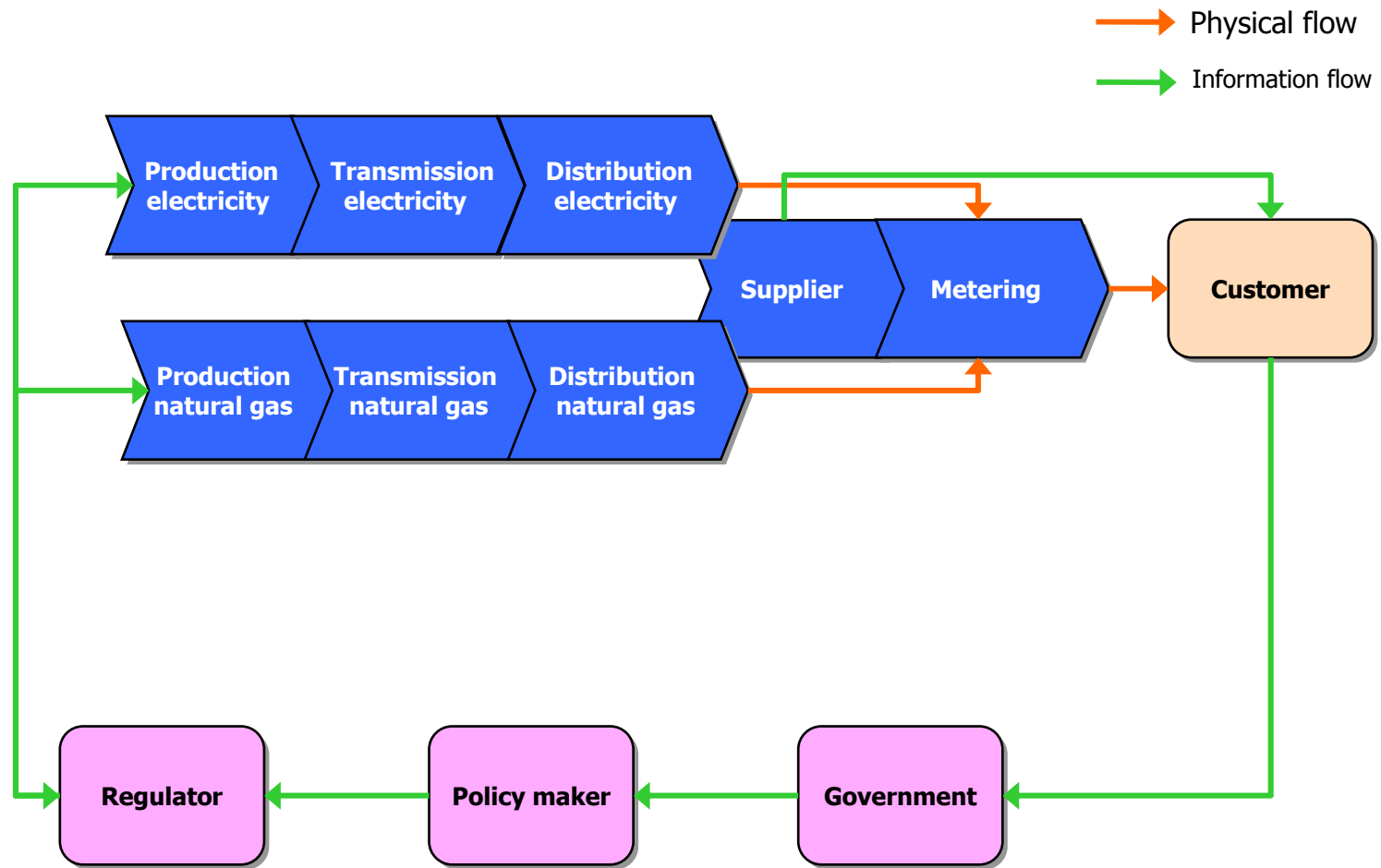


# Togaf architecture

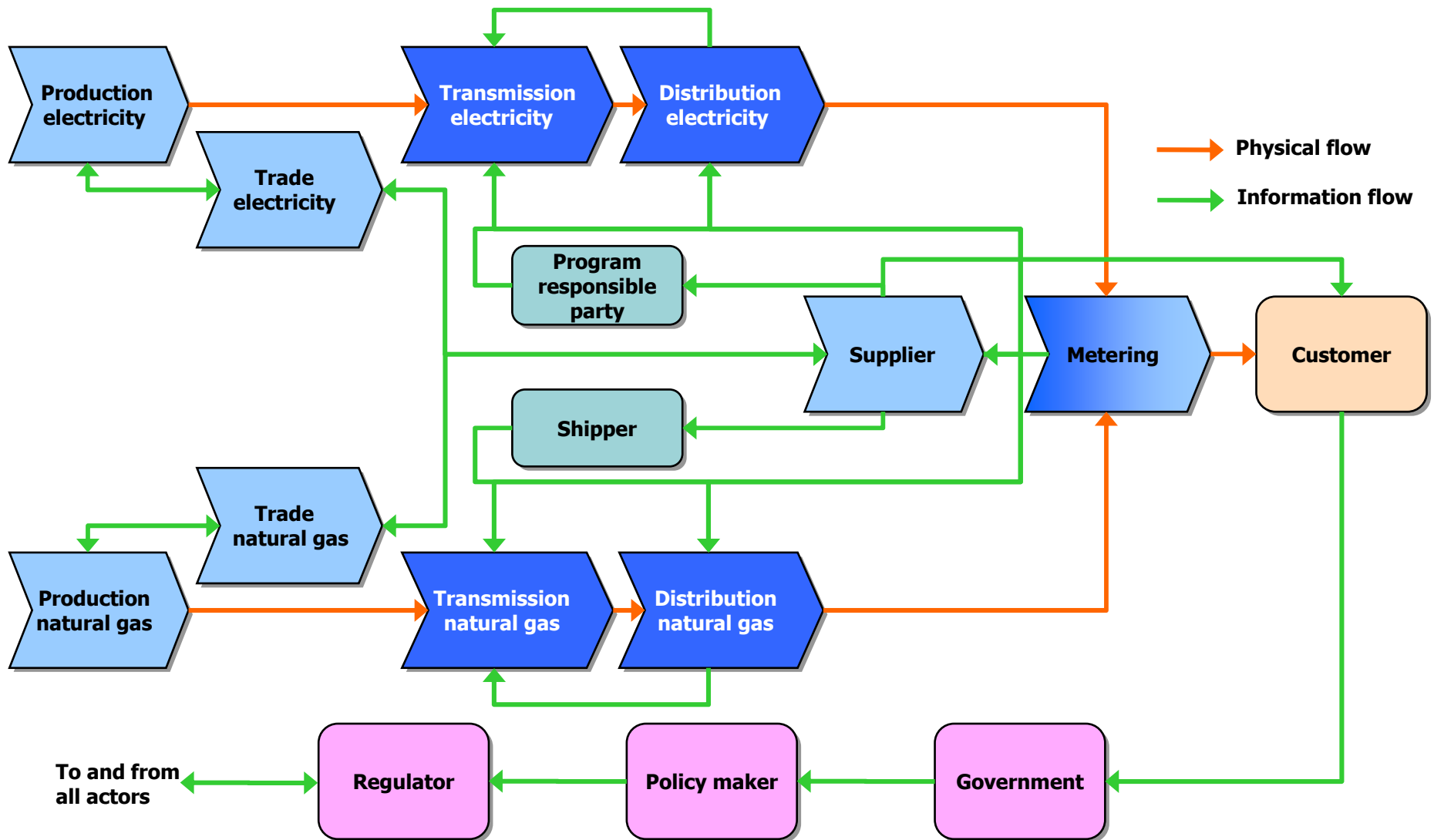


Source: *Togaf 8*

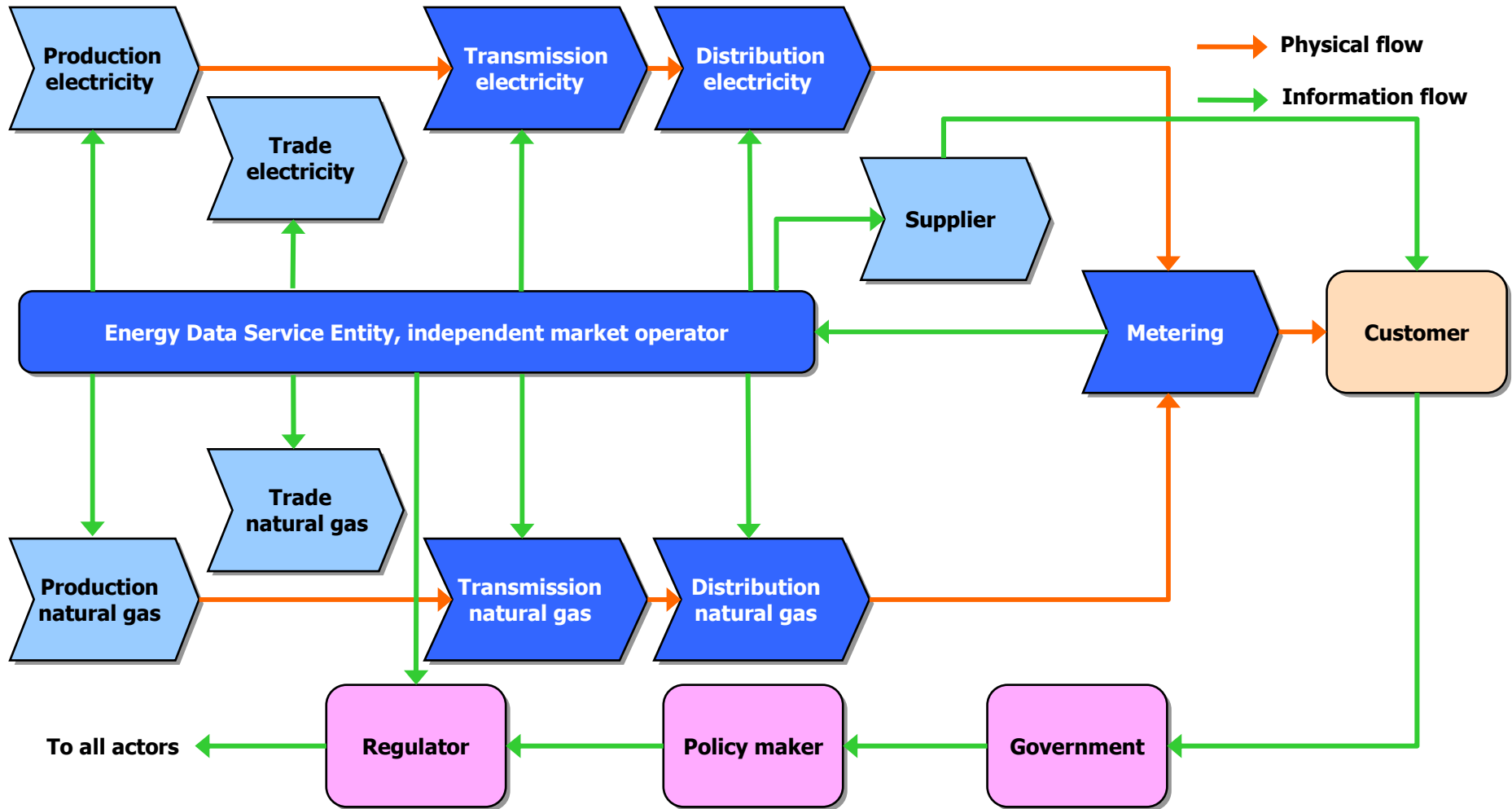
# High level information architecture, As-Was



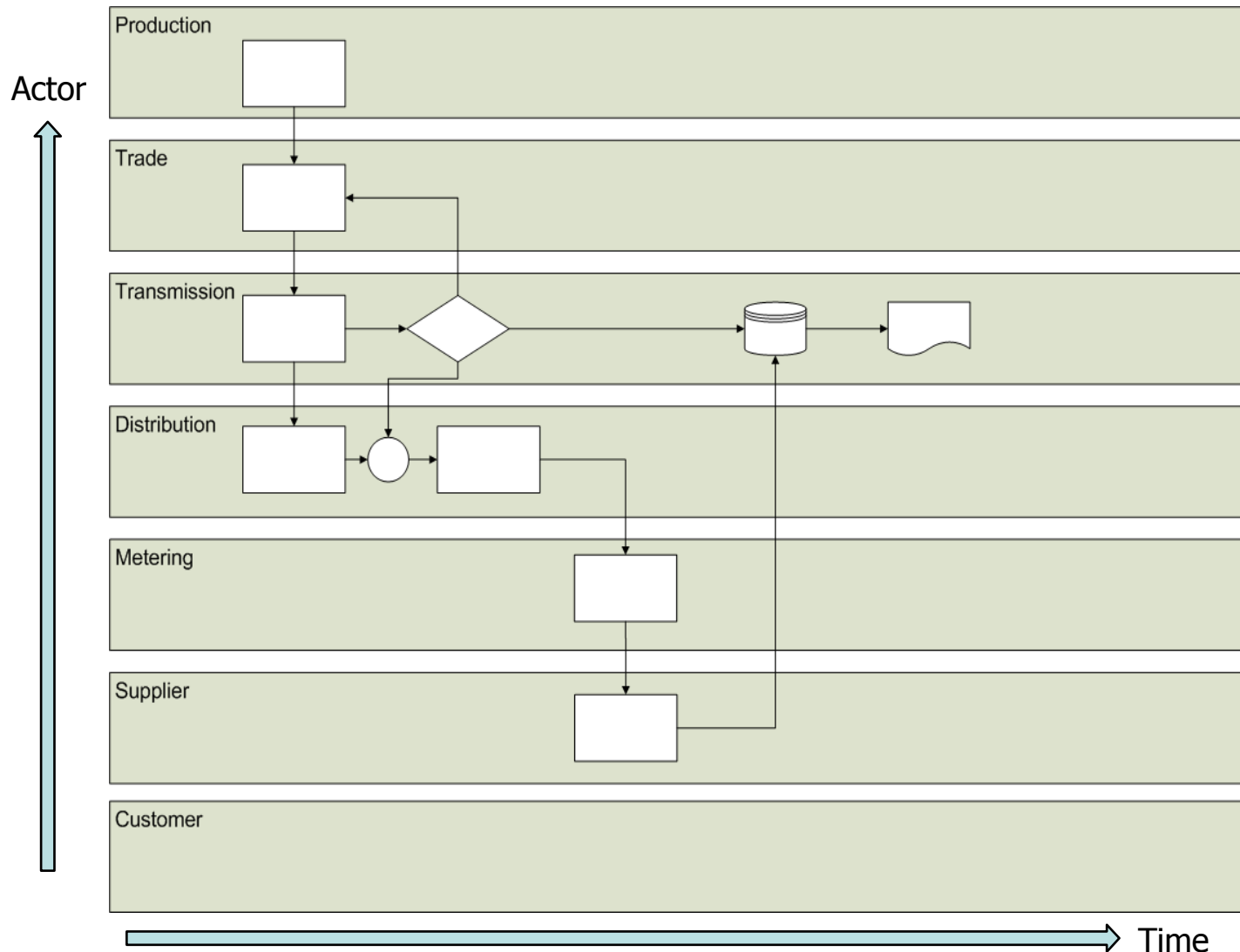
# High level information architecture, As-Is



# High level information architecture, To-Be



# Swimming lane representation



Units:

- Responsible actor
- Process steps
- Data collection
- Messages
- Decision moments
- Subsequent processes
- Interface, input and output per process

# Conclusions and recommendations

- Full ownership unbundling best achievable transparency, meets objectives in the third energy package
- Full ownership unbundling most likely lowest regulatory effort and the lowest transactions costs
- Operational processes assigned to technical functions or commercial functions, critical or non-critical
- Information technology essential foundation for design of operational processes
- Align institutions with technology in a coherent manner, include information technology, alignment requires information architecture
- Current situation NL not yet fully on par with process designing an information architecture, main reason is institutional arrangements are continuously changing in finding a new equilibrium
- Information architecture, design of information governance, considered non competitive for all actors, therefore recommend to regulate the information flows in the energy value chain by an information code
- Transaction costs can be reduced by economising scale and scope, therefore recommend a centralised data base for all registries in the energy value chain
- Regulate and facilitate by independent energy market operator, governmentally owned
- Revisit institutional arrangements metering actor given the importance of metering data for both technical and commercial functions, and 20/20/20 EU target
- Carry out stage 2, 3 and 4 of this study and report