Experiences of the Dutch datahub

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Datahub

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INTRODUCTION:

Service area

- Electricity and gas Stedin
- Electricity and gas DNWG

Roger Brouwers

DNWG Manager Clients & Markets

- Introduction
- Historical context
- Governance

Miriam Withagen

DNWG Manager Markets

- Performance
- Lessons learned
- Next steps

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STEDIN GROUP KEY FIGURES
2018

Electricity

2,283,736
Electricity connections

19,637 GWh
Of electricity transmitted

19 MIN
Average interruption duricity electricity

55,540 KM
Of electricity cable (planets circumference is appr. 40,000 km)

Gas

2,114,088
Gas connections

1,344,080
customers have received the offer for a smart meter (end of 2017). Appr. 2.5 million meters (E and G) in a period of five years

4,377 MLN M³
Of gas transmitted

74 SEC
Average interruption duration gas

28,244 KM
Of pipes (planets circumference is appr. 40,000 km)

69%
OF OUR CUSTOMERS AWARDED STEDIN A 8 OF HIGHER FOR SERVICES PROVIDED

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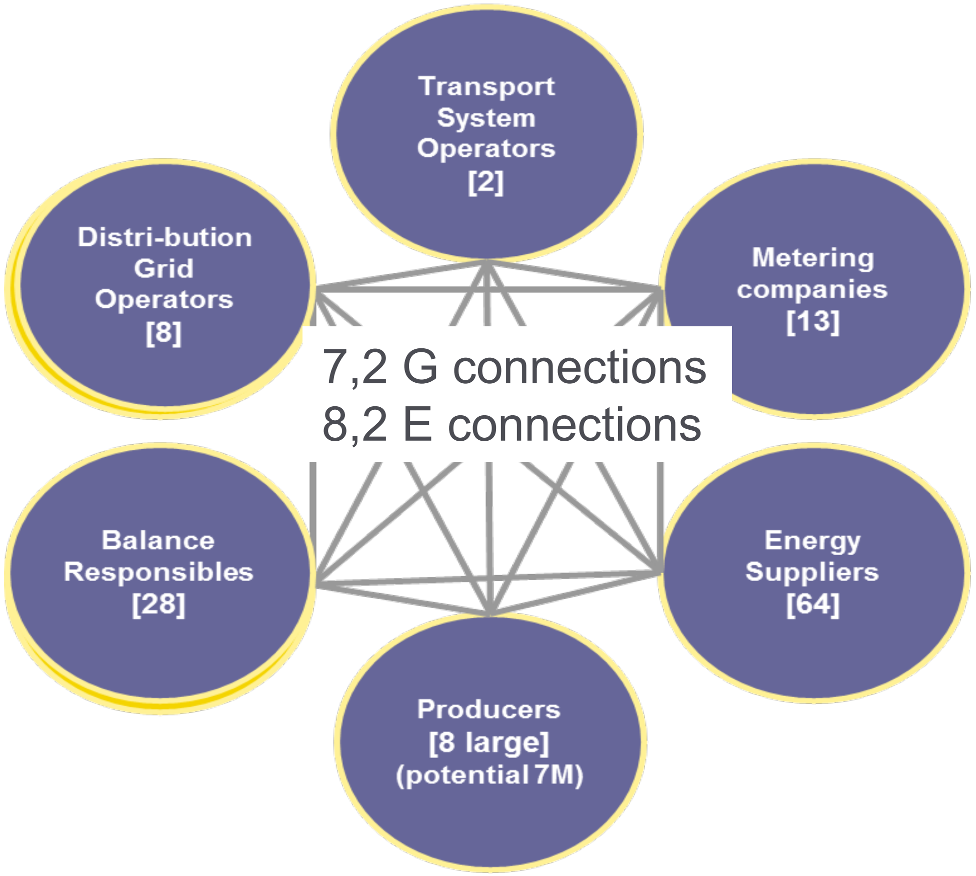
HISTORICAL CONTEXT:

Dutch market characteristics and shared vision of dominant energy companies (voluntairily) led to central market facilitation



1998	1st phase of liberalisation: Heavy industry and Wholesale
2002	Major incumbents initiated Energy Clearing House, 2nd phase of liberalization: B2B plus green B2C
2004	3rd phase of liberalization: B2C and SME
2005	Administrative challenges
2007	Establishment of NEDU as a platform and EDSN as a central hub
2009	Coordinated improvement effort by sector and government Decision of grid operators on centralizing market facilitation
2014	A stable administrative model ready for future developments

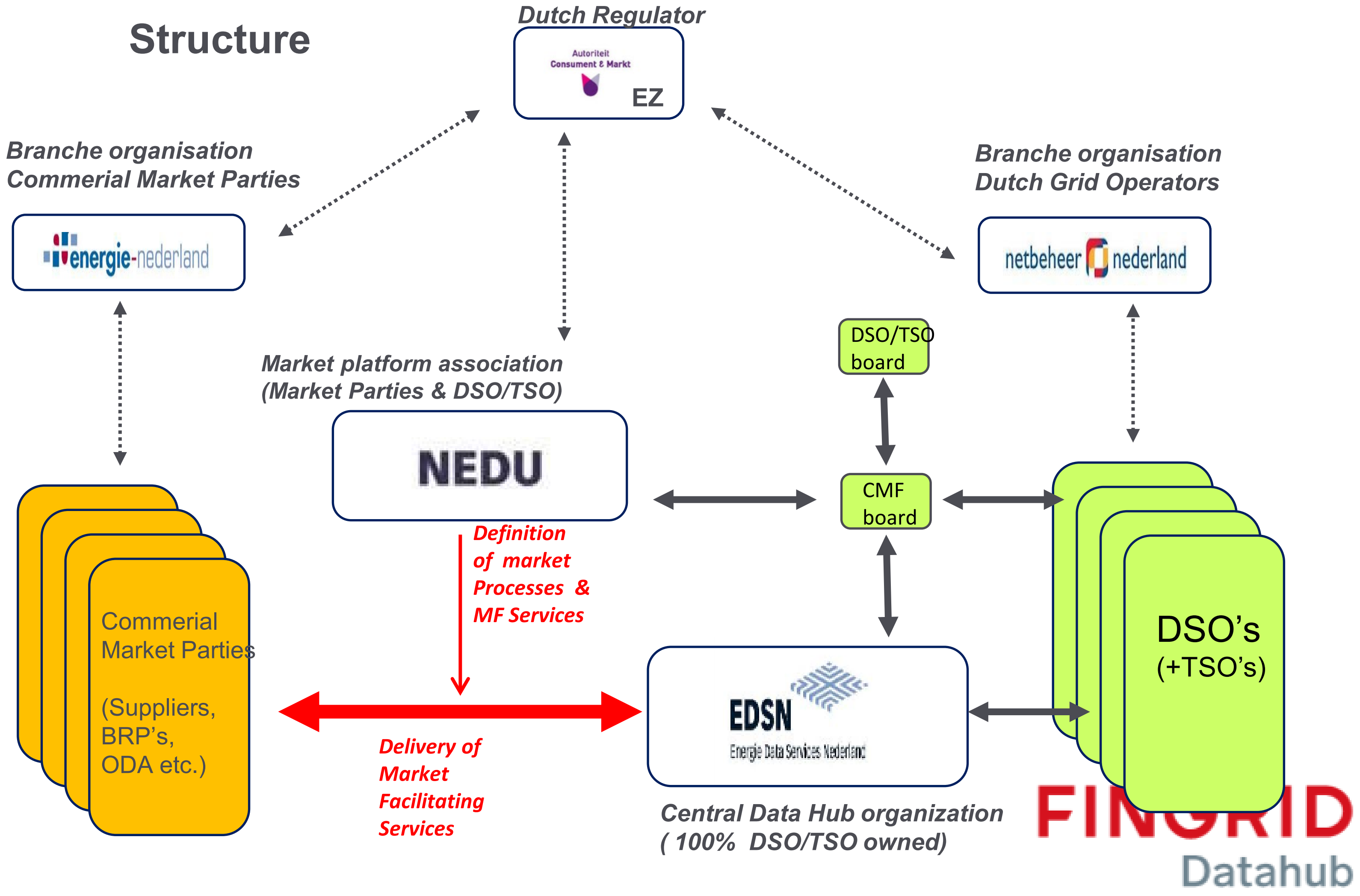
GOVERNANCE DUTCH ENERGY SECTOR

Culture

The energy market is based upon self regulation & consensus between de 8 DSOs and the TSO

Dutch culture is based upon consensus. In the business also known as "polder model"

Structure



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SERVICE LEVEL AND PERFORMANCE:

Characteristics of the Dutch market:

- High level of self regulation
- 10 incumbent suppliers
- 90 new entrants (45 < 3 years)
- C5 contains 2 start-ups:
  - The current price leader
  - A sustainability focused differentiator
- >50% of Supplier market share foreign owned
- >80% of production capacity is foreign owned
- Grid companies are 100% publicly owned
- **15.7 mio** Metering Points (E+G combined)

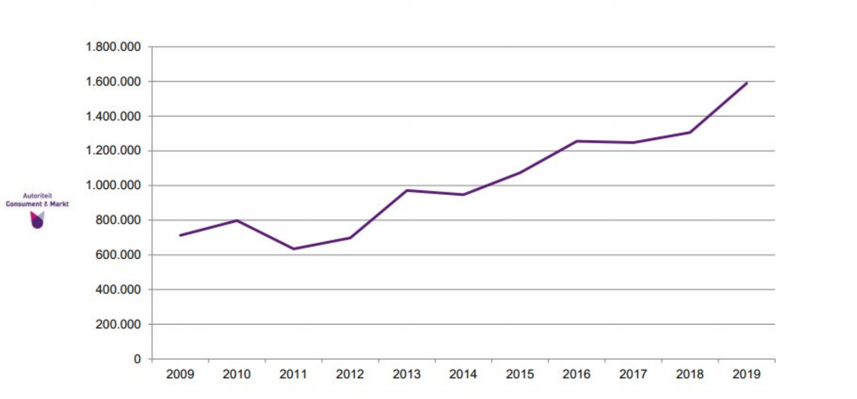
Excellent market facilitation:

- near time switching one day ahead
- near time move on same day

Characteristics of the Dutch market facilitation:

- Predictable
- Reliable
- Transparent

High Switching rates:

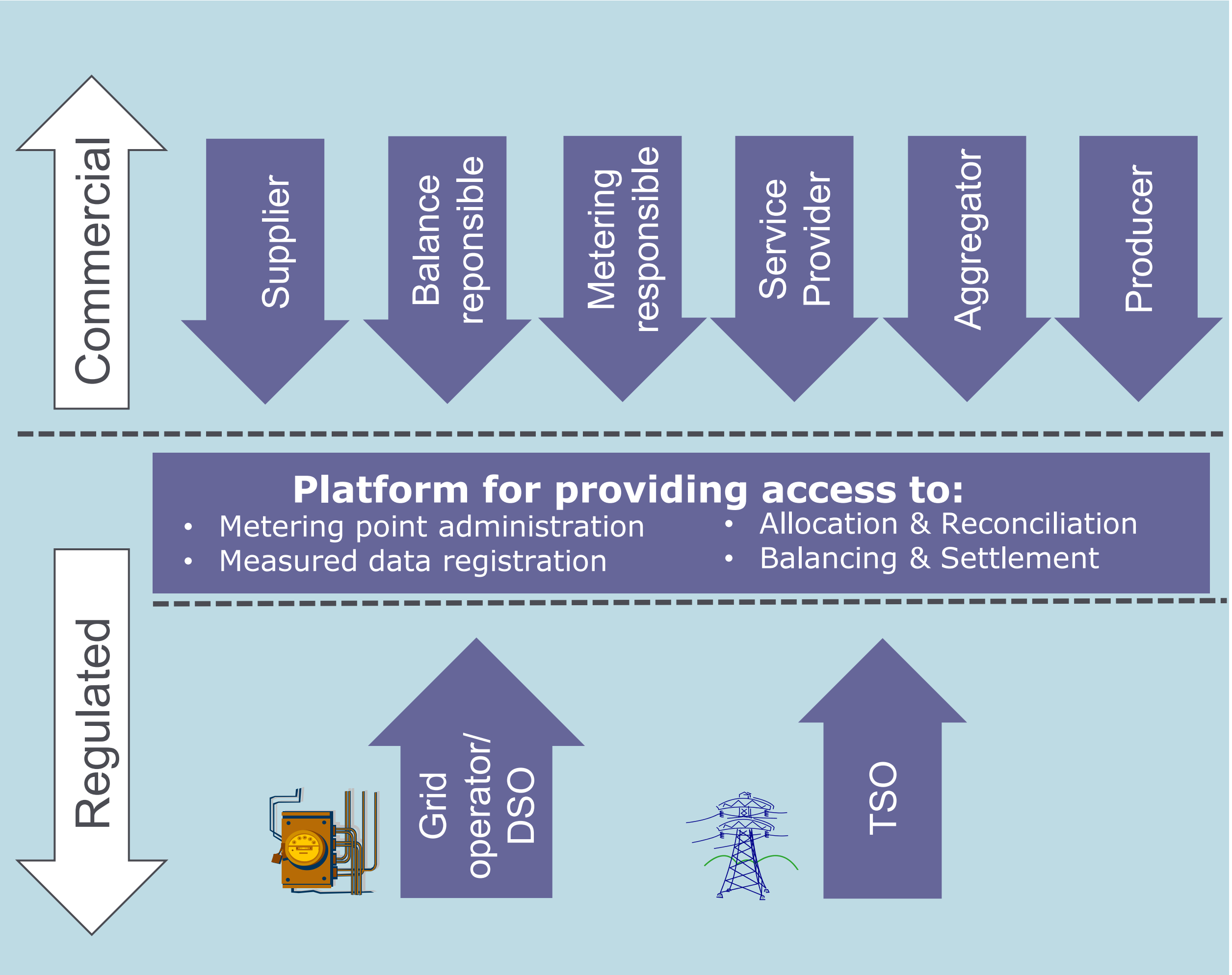


Electricity switching rates in 2010 compared (%)

Country	Switch Rates
	%
Belgium	10,0%
Sweden	9,4%
Netherlands	**8,9%**
Finland	7,6%
Spain	7,4%
Germany	6,3%
Italy	5,9%
Denmark	4,3%
Czech R.	3,3%
Portugal	2,3%
France	2,0%
Slovenia	1,9%
Austria	1,8%
Lithuana	1,3%
Slovak R.	1,0%
Luxembourg	0,2%
Poland	0,1%
Romania	0,1%
United Kingdom	N/A

Source: Think Topic 12 (2013) *From Distribution Networks to Smart Distribution systems*

MARKET FACILITATION IS ESSENTIAL FOR A WELL FUNCTIONING LIBERALIZATION AND COMMERCIAL DOMAIN



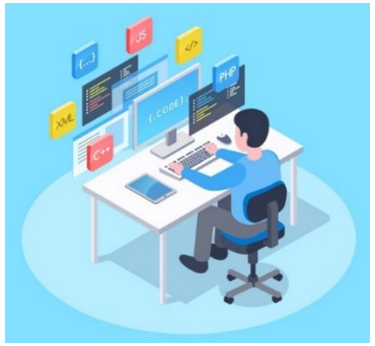
Market facilitation as a platform results into:

- A well functioning market: metering point data, measurement data and data for allocation and reconciliation must be complete and easily accessible;
- Consistent data: measured data consists of time series that need to be kept together over time to maintain historical consistency;
- Easy access towards existing and new markets;
- Level playing field for data access facilitates competition and innovation (no lock in with data aggregators).

IMPROVE CONTINUOUSLY:

LESSONS LEARNED:

1. Prioritize ICT, expand to market and the customer
2. The Central hub is an enabler for improvement
3. Involve (if possible) all roles and all parties
4. Collaboration is fun!



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ROADMAP MARKET FACILITATION:

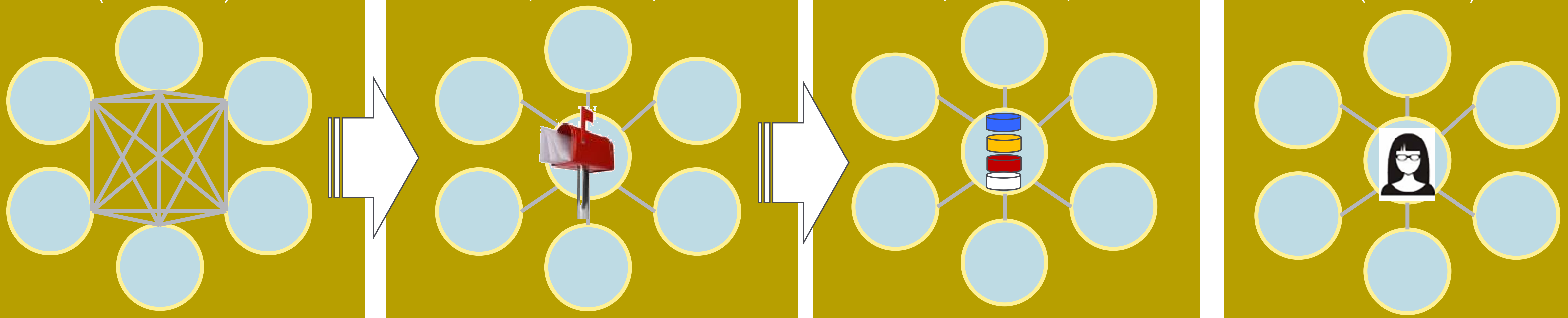
EDSN develops and operates the Dutch energy data hub on behalf of the Dutch transmission and distribution system operators. The purpose of EDSN is to ensure optimal functioning of the Dutch energy market with uniform communication methods, transparent market processes and secure data access.

Multi/Bilateral (1998-2001)

Communication Hub (2001-2007)

Data Hub (2007-2020)

One virtual grid operator (2020-…..)



Multi/Bilateral (1998-2001)

- Multi/bilateral messaging
- Unguided and heterogeneous processing
- Individual costs

Communication Hub (2001-2007)

- Central communication hub
- Standardized messaging
- Guided processes
- Heterogeneous processing
- Shared costs

Data Hub (2007-2020)

- Centralized data registers
- Standardized messaging
- Guided processes
- Uniform processing
- Shared costs
- Allocation/reconciliation
- Meter readings

One virtual grid operator (2020-…..)

- Centralized data registers
- Standardized messaging
- Uniform processing
- Shared costs
- Operation model based on value chains
- Shared vision + roadmap
- Customer in control over own data

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POSTCARD FROM THE FUTURE:

Postcard from the future* o.b.v. Outlook MF 2020-2030

Dear colleagues,

The energy transition of the past decade has shown to be a success, specifically for the past decade.

In the current energy market, an optimal harmony has been created between sustainability, reliability and affordability. Furthermore, the clients are 100% in control of their own data and to make their own energy choices.

We facilitate transparent and reliable (flex)market processes and share the latest data with all the stakeholders.

Market players experience the many different grid operators as one uniform service provider.

The agile and robust organization ensures new services which are rapidly developed and realistically priced.

We play a key role within the collaboration with our partner, because they acknowledge and value our expertise, transparency and proven reliability.

Therefore, we are proud of our collective achievements!

See you in 10 years,
Your virtual grid operator

Amersfoort
2030

Wish we were here

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Overview of the Dutch DSO market

The service area of Stedin covers the following main economic areas: Rotterdam, The Hague and Utrecht

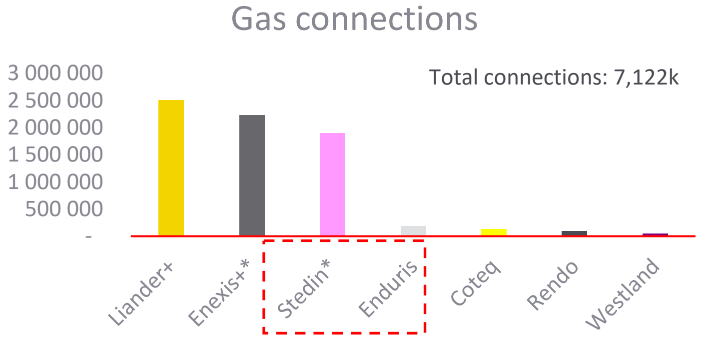
Dutch Energy Market Structure

Regulated | Quasi-Regulated | Non-Regulated

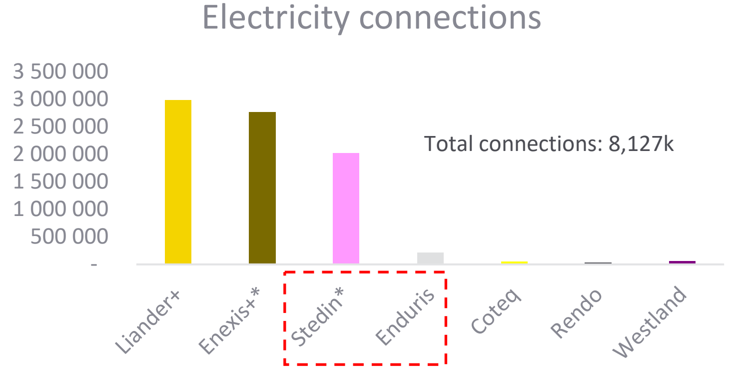
	Renewable generation / Conventional generation	Transmission	Distribution	Supply
Key electricity players	• Eneco • RWE / Essent • Vattenfall • PZEM	• TenneT	• **Stedin** • Enexis • Alliander	• Eneco / Oxxio • RWE / Essent • Vattenfall • DELTA
Key gas players	• Gastera • E&P companies	• Gasunie	• Stedin • Enexis • Alliander	• Eneco / Oxxio • RWE / Essent • Vattenfall • DELTA

- Transmission and distribution of electricity and gas are regulated businesses in the Netherlands
- The regulator (ACM) allows the Transmission System Operators (“TSO’s”) and DSOs a reasonable return on their cost based on a determination of a WACC per regulatory period
- Currently the WACC decreases from 4.04% in 2017 to 3.00% in 2021
- DSOs have recently swapped or sold concession areas in order to better follow province borders and further increase efficiency

Market Positions



+= Liander and Enexis swapped concession areas per 2016, which includes the integration of DSO Endinet in Enexis. Numbers here represent this new situation.
*= Enexis acquired a concession area of Stedin in 2017. Numbers here already represent this new situation.



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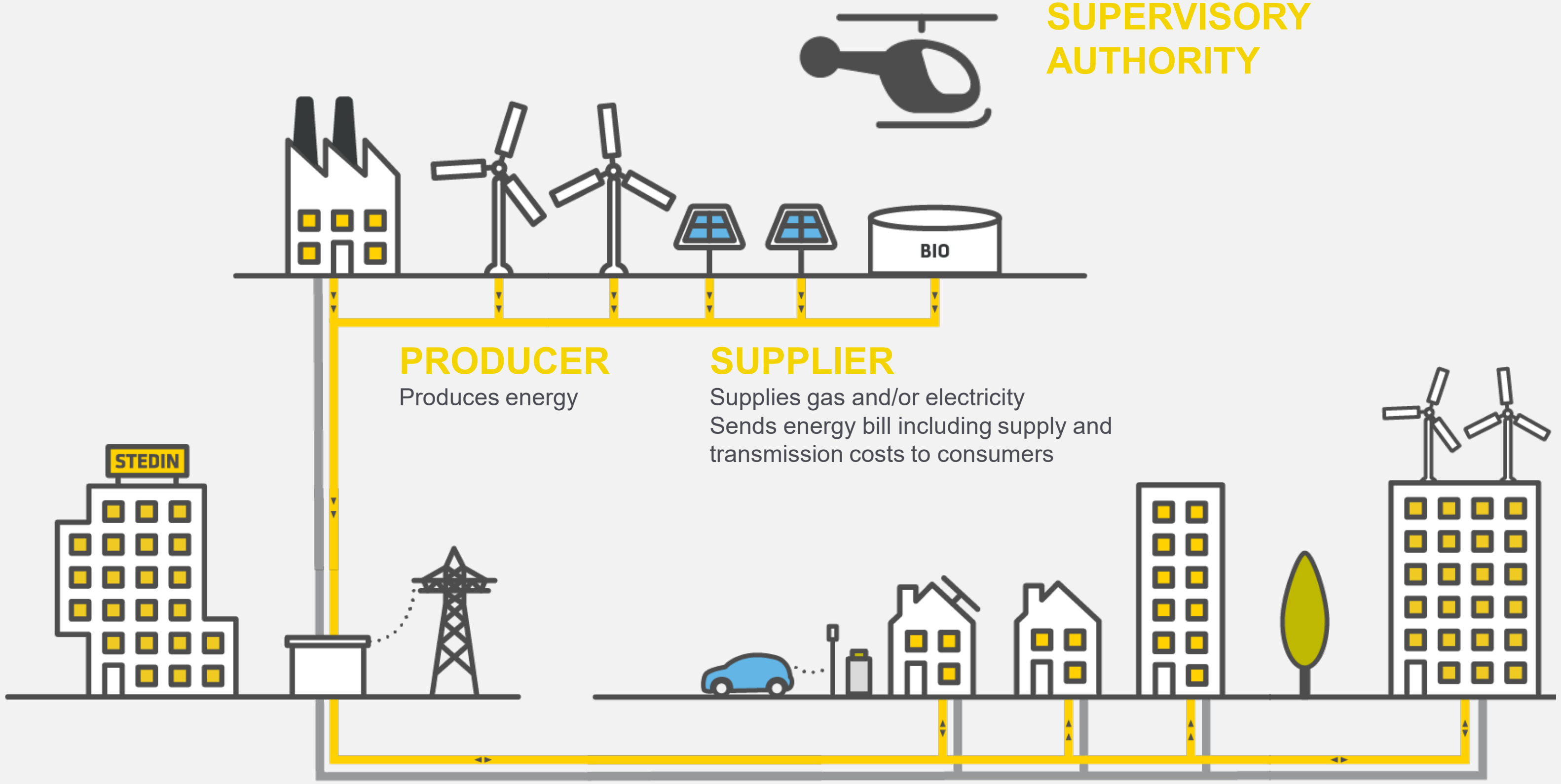
OUR ROLE IN THE **ENERGY MARKET**



SUPERVISORY AUTHORITY

PRODUCER
Produces energy

SUPPLIER
Supplies gas and/or electricity
Sends energy bill including supply and transmission costs to consumers

GRID OPERATOR
Maintains, expands and replaces the gas and electricity networks

CONSUMERS
Select supplier and product

BUSINESS CUSTOMERS
Select supplier and product
are capable of producing own energy