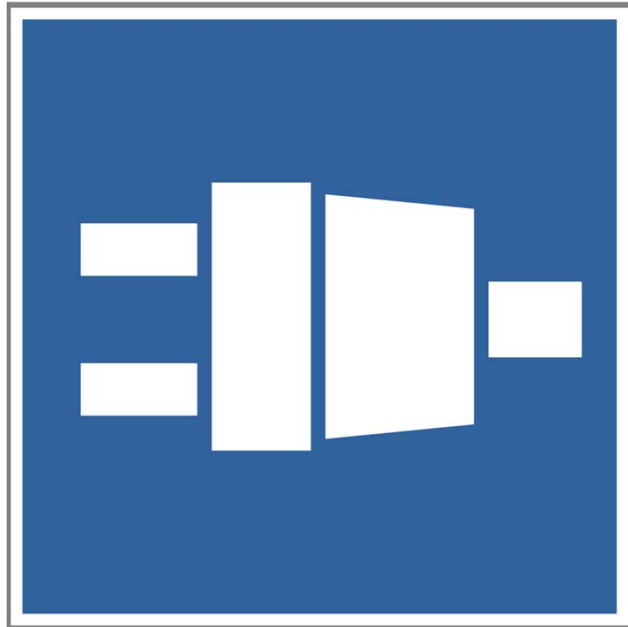




Rijkswaterstaat
Ministry of Infrastructure
and Water Management



Shore-side electricity

Situation and standards in the
Netherlands

Roelof Weekhout MSc BEnvE
February 2022



This presentation

- History 2005-2022
- Current situation Netherlands
- Supply side
- User side

SSES = *Shore-side electricity supply*

And since 2004:

220 V → 230 V

380 V → 400 V



History



Recent history:

- **2005** Parliament demands more shore-side electricity in ports
- **2007** Sea ports take initiative for national and international approach (sea & inland SSES)
- **2008** Standard for inland SSES in sea ports
- **2013** First generator prohibitions in Rotterdam & Amsterdam
- **2014** European directive *Clean Power for Transport* 2010/94/EU
- **2016** Inventory & policy framework inland SSES



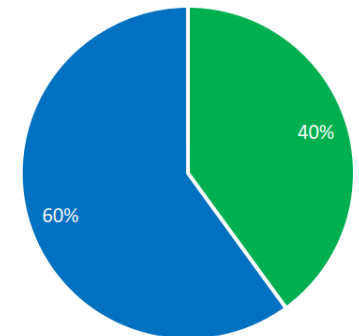
Survey



- Quick scan:
73 ports selected (>350 Mton)
10 additional ports during survey
-5 ports no longer in use in 2016
- Survey 78 ports:
 - what is available?
 - what payments system?
 - what rates?
 - future plans (generator ban?)
 - is supply enough for IN?

78% response

- 60% of all ports supply SSES

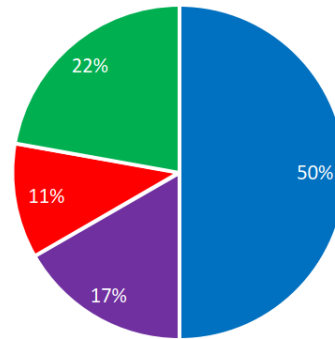




Current situation

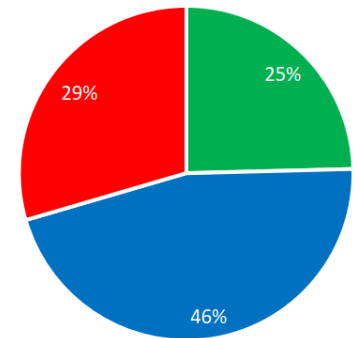
- Current situation

of connections in ports



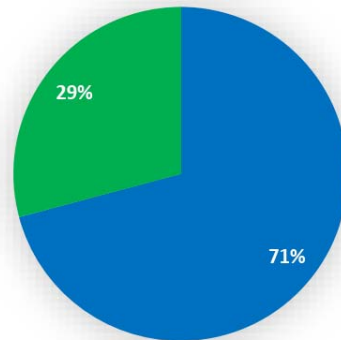
■ 1-5 stations ■ 6-10 stations ■ 11-20 stations ■ >20 stations

Power output



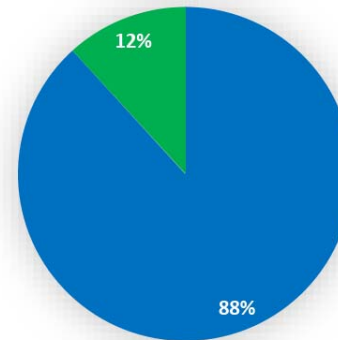
■ 380 - 16A ■ 380 - 32A ■ 380 - 64A
+ 230 - 16 A everywhere

Developing new SSES



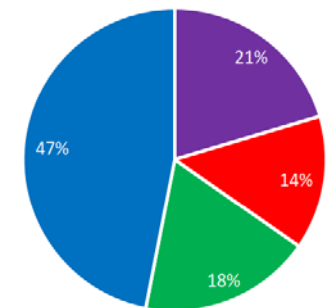
■ No plans yet ■ Plans in progress

Need for more SSES



■ No demand ■ Demand for SSES

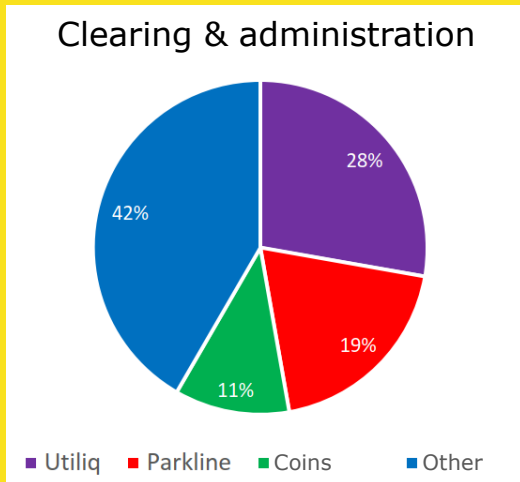
Hardware suppliers



■ Utiliq ■ Parkline ■ Seijsener ■ Other



Supply

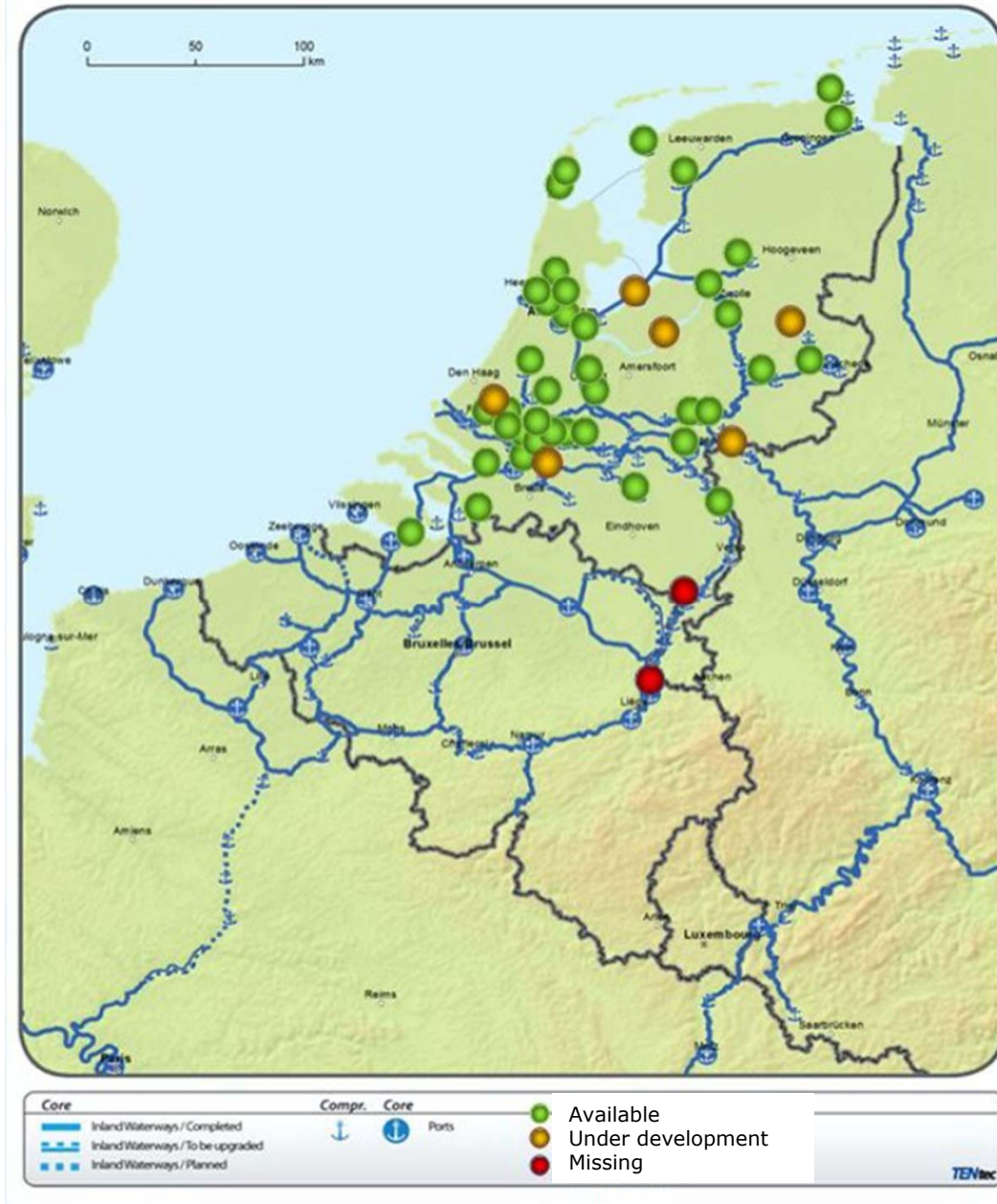
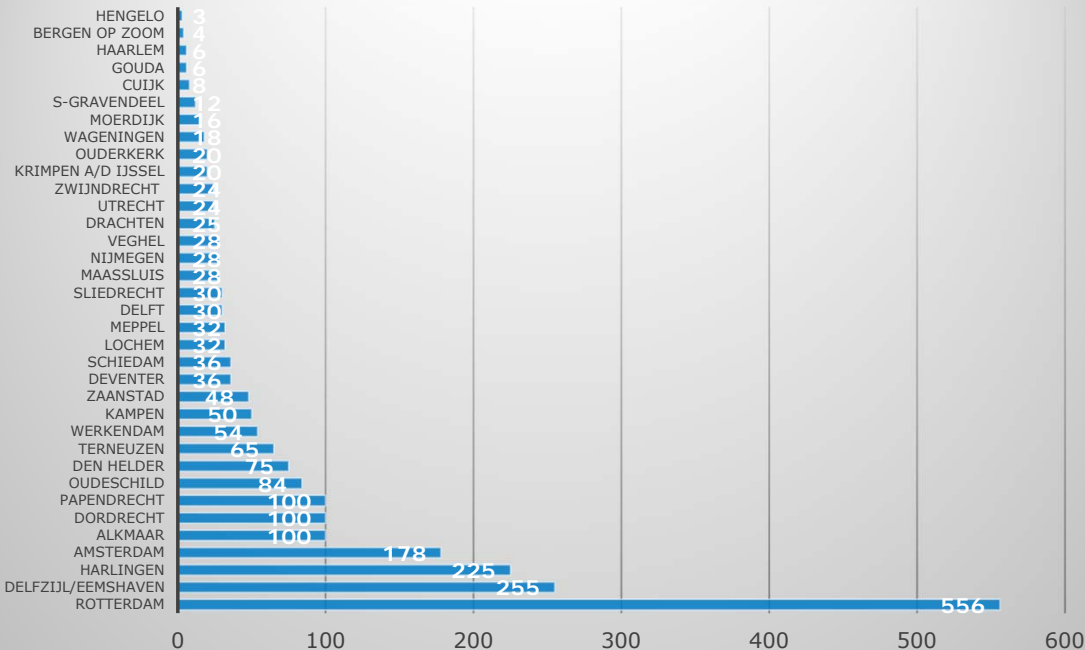


- Hardware: **16** suppliers
- Clearing & administration: **4 +70**
- Payment options:
 - Coins (pre-pay)
 - ECO-card
 - Private card (eg. Park-line)
 - SEP-key (Seysener)
 - Credit card
 - Direct billing or cash
 - Port dues
 - Free SSES
- Rates:
Free - € 0,23 - € 0,27 - € 0,50



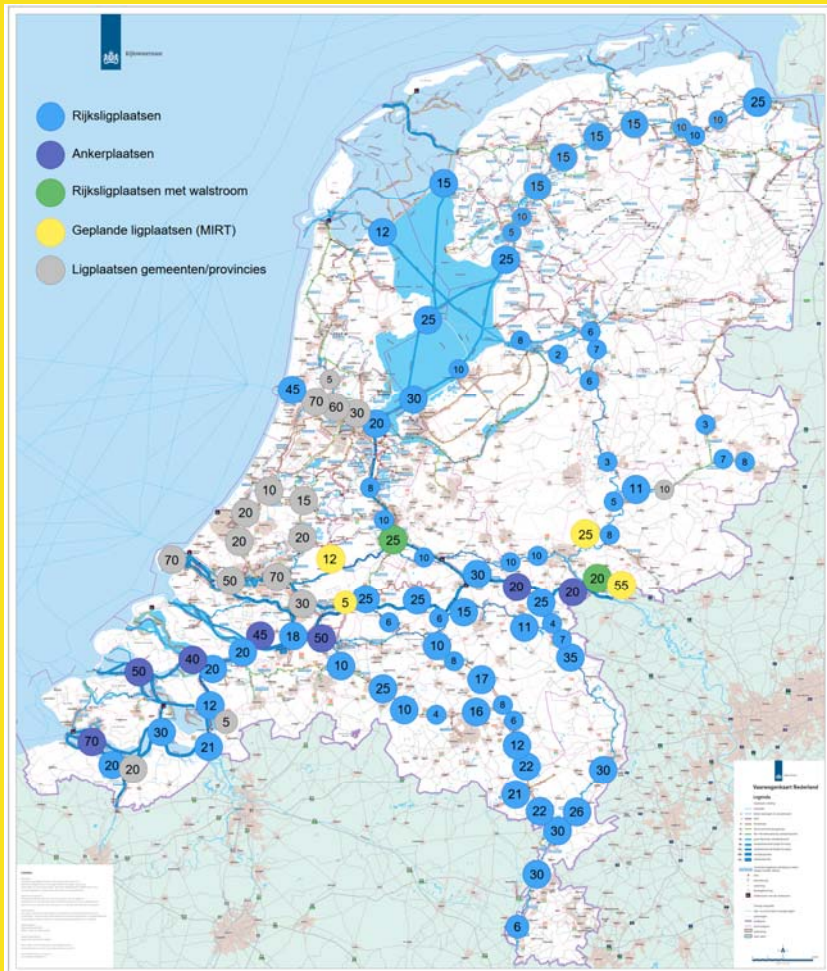
Supply

Physical SSES-connections





Supply



- Only **TEN-T** (compr. network) inland ports in **survey**
- Left out: State-owned berths
 - approx. 1.000 berths
 - - 50 with SSES
 - - further 100 planned with SSES
 - - 450 viable candidates for SSES
 - - 100 privately owned berths...
- End of 2020: Minister for Transport decides: *“all (viable) state owned berths will be equipped with SSES”*



Users



- 2008 National Sea Ports Directive for SSES Inland Navigation:
 - 400 V \sim , 63 A, 50 Hz
 - NEN1010 appr. supply stations
 - 3P+N+E Industrial Power Plug
 - NTA 8130 Smart meters
 - GPRS communication
 - 300 mA ground fault RCCB (*residual current circuit breaker*)
 - 50 – 100 m ship leads
- EN 15869 differs slightly:
 - Up to 125 A current
 - 30 or 500 mA residual current
 - Only EN 15869-3 shore cables
- ES-TRIN 2021:
 - EN 15869 for $I \leq 125$ A
 - EN 16840 for $I > 250$ A



Future challenges



- Can power grids supply SSES ?
- Harmonisation of payment systems (*accept all*) ?
- Implementation of EN 15869
- ESTRIN & power requirements for passenger vessels ?
(*approx. 6 kWh per person*)
- SSES between 125 and 250 A ?



Questions?