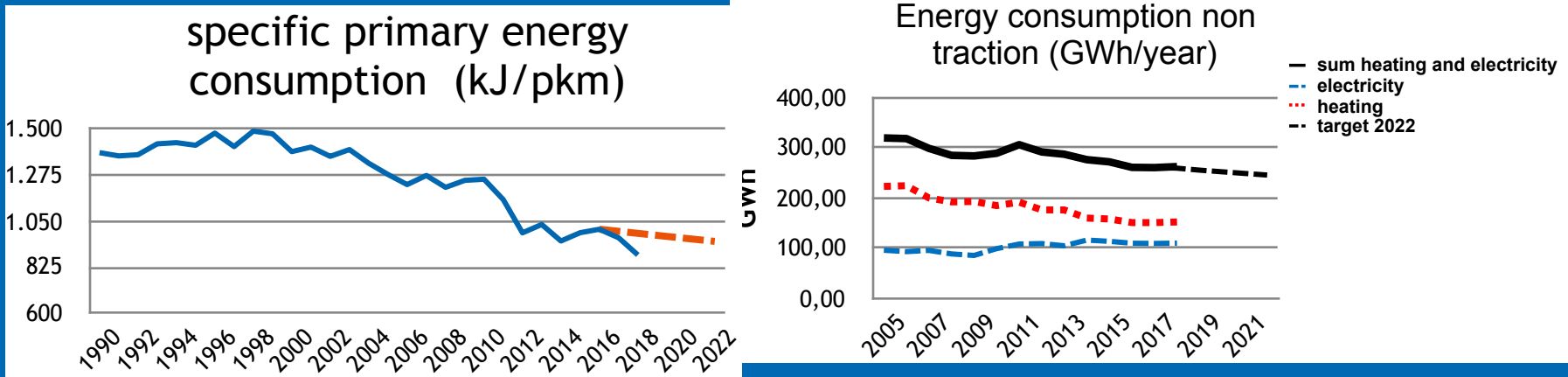


on track towards a more sustainable energy consumption



Energy saving in rail
Utrecht 27/03/2019

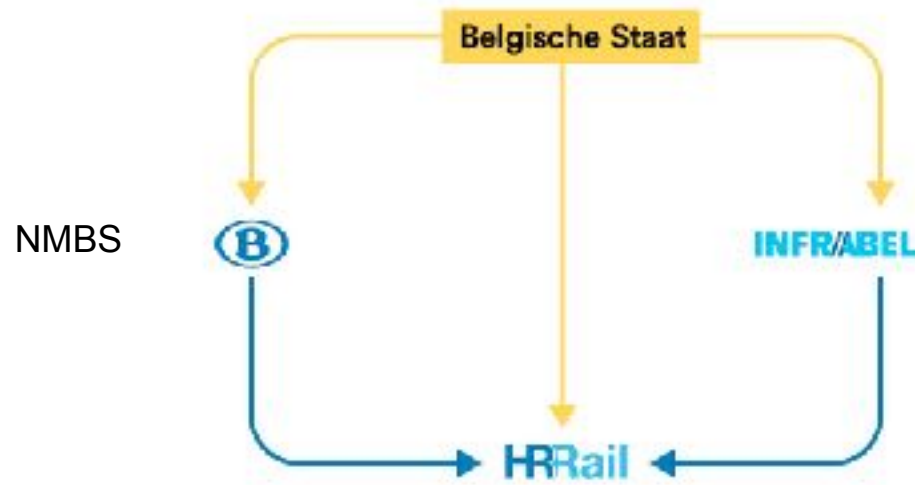
Wim Bontinck
Environmental and energy management SNCB/NMBS
President of EES platform (Energy, Environment, Sustainability) of
UIC (Union Internationale des chemins de fer)



NMBS = Belgian railway operator passengers

Operator of all passenger trains in Belgium except Thalys, Eurostar and ICE trains

limited liability company under public law



Energy consumption of NMBS in 2018



1197 GWh = yearly consumption of 350,000 households



1.473 GWh/j



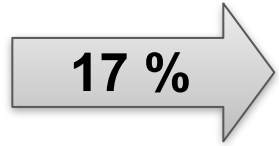
Electricity : 1.197 GWh/j



Nat gas/fuel: 276 GWh/j



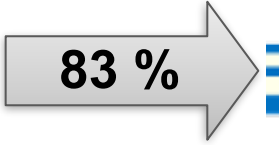
103 800 000 €



17 %



17.700.000 €



83 %



86.100.000 €

Non traction energy, target 2022

improve the energy efficiency of buildings and fixed installations of NMBS

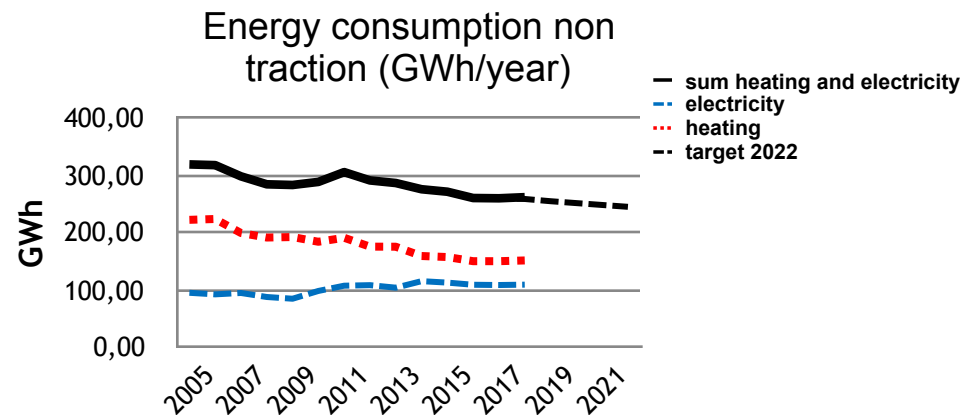
2016-2022

-7% (kWh)

Degree-days and activity corrected energy consumption



Integrated in federal climate and energy plan



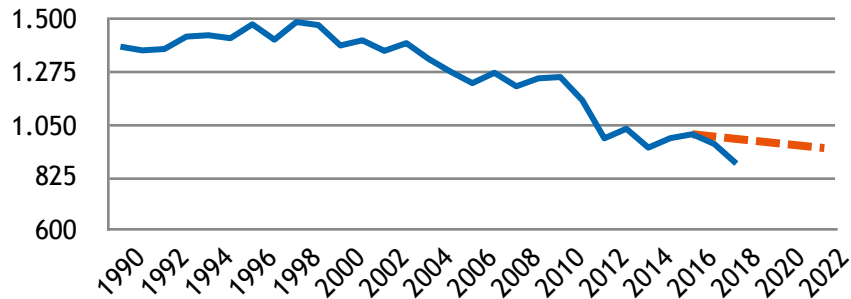
≈ 1.000.000 EUR



Not on track in 2018: increase of 1% compared to 2017

Traction Energy, target 2022

specific primary energy
consumption (kJ/pkm)



Target 2016-2022: ⇨ -5% (E/pkm)



Integrated in federal climate and energy plan



On track in 2018: reduction of 1% compared to 2017

A more sustainable energy consumption in 3 steps

1. ENERGY EFFICIENT ASSETS (BUILDINGS, INSTALLATIONS, TRAINS)
2. MORE ENERGY EFFICIENT USE OF THESE ASSETS
3. DECARBONISE

A more sustainable energy consumption in 3 steps

- 1. ENERGY EFFICIENT ASSETS (BUILDINGS, INSTALLATIONS, TRAINS)**
2. MORE ENERGY EFFICIENT USE OF THESE ASSETS
3. DECARBONISE

1. Invest in more energy efficient buildings: stations, offices, workshops

- Ledification: buildings, platforms, parkings and parking buildings
 - Total area to be illuminated: 350 ha
 - 50% led by 2022
 - 100% led by 2030
- New buildings are “**NZE-buildings**” (Nearly Zero Energy)
- Major **energy renovation** of buildings: insulation of building envelope, efficient HVAC, renewal of windows ...;
- More energy efficient devices in stations such escalators, elevators, displays,



The most energy efficient energy consumption is the avoided

1. Invest in energy efficient trains



- Facilitate ATO and/or DAS
- New trains: Lower specific energy consumption (e.g; E/seatkm)
 - Double deck couches have lower mass per seat
 - Flexible composition
 - Nice design and comfortable so attractive
 - Automatic closing outside doors
- Ledification
 - the new trainset serie M7 (to be delivered from 2019) will be the first train with led lights
 - Ungoing research to replace about 86,000 fluorescent tube T8 lamps in all existing trains



15% to 20% of the annual energy consumption of a train is for heating, ventilation, lighting, cooling, ...

A more sustainable energy consumption in 3 steps

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- 2. MORE ENERGY EFFICIENT USE OF THESE ASSETS**
3. DECARBONISE

2. More energy efficient use of our buildings

- Make maximum use of **daylight**, only illuminate where and when necessary and with no more lux than necessary;
- Only heat, cool and ventilate where and when necessary and not warmer (or colder) than necessary;
- More intelligent **measurement** and assessment of the energy consumption



What you can't measure, you can't manage

2. More energy efficient use of our trains

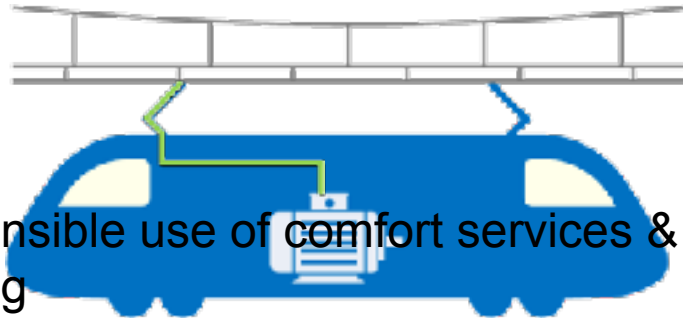
- LF (Load-factor) management! Aspire an average LF of more than 30%
- modal shift, more trains but not at the expense of a lower average LF
- Make maximum use of **daylight**, also in trains
- Eco-driving , Eco-stabling, Eco-time tabling

Some trains consume in one day more energy when the are standing still in a siding, than when to are commercially used



Energy-efficient traction

✓ Optimal use of “dynamic” braking



✓ Responsible use of comfort services & eco-stabling

- ⇒ Energy recovery
- ⇒ Reduced wear of brake pads...

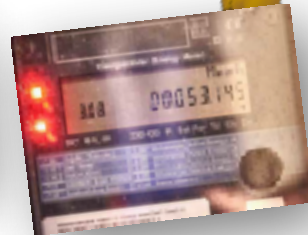
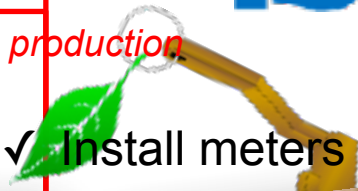


- ⇒ ~~Safe~~ accelerate
- ⇒ Know your route (profile, stops, ...)
- ⇒ Avoid energy-efficient signals

✓ eco-driving



✓ Install meters



On locomotives T18/19 and train sets MR08 and M7 appropriate software included


In 2022, 65% of train production

50% of actual train production



Raise awareness among train staff

Eco driving is only possible if the train leaves on time

- ✓ Punctuality first departure
- ✓ Departure procedure 10 juni 2018 

Responsible use of comfort services

- ✓ Switching the lights off or at half way where and when possible: Less energy for lighting and in summer less energy for cooling
- ✓ Reporting (in winter) too hot or (in summer) too cold climate adjustment

Meticulous application of Eco-stabling procedures

- ✓ Doors closed
- ✓ Lights switched of
- ✓ "heating in mode °5C



A more sustainable energy consumption in 3 steps

1. ENERGY EFFICIENT ASSETS (BUILDINGS, INSTALLATIONS, TRAINS)
2. MORE ENERGY EFFICIENT USE OF THESE ASSETS
- 3. DECARBONISE**

3. Decarbonise

- Electrification: tracks and trains
- Heating of buildings
 - ✓ Phase out of fuel oil
 - ✓ No boilers older than 25 years
 - ✓ More heat-pumps
- Cooling of buildings
 - ✓ more free cooling
 - ✓ Automatic sunscreens
- Maximum use of solar boilers and small CHP installations
(Cogeneration or combined heat and power)
- PV-installations on railway assets
- Facilitate windfarms near railway substations



end 2019, 20.000 PV panels on NMBS assets.

ISO50001 certified since 18/12/2017



- With the ISO 50001 certification, the proper functioning of the NMBS energy management system is formally validated;
- The ever stricter legislation is a motive for obtaining the ISO 50001 certificate;
- Replaces the energy audit obligation as "large company"; (Directive 2012/27)
- the scope will be expanded to include traction by the end of 2020
- Energy efficient is cost efficient;
- Energy efficient is corporate social responsible

CERTIFICAAT

EN ISO 50001 : 2011 Energiemanagementsysteem

VERGOTTIE nv

Jan Orlaengelelaan 39
1800 Willebroek, België

Wij certificeren dit

WVVOG - SWCO nv/na

gevestigd te

Zalfpoortlaan 40

1800 Willebroek, België

een energiemanagementsysteem heeft ingevoerd en op het gebied, dat overeen is met de eisen van de norm EN ISO 50001 : 2011 "Energiemanagementsystemen" voor:

Het exploitatiebeheer van de afvalvat, de afvalketen, de afvalopbouw, de werkplaats en de onderhoudsposten voor het rolfabrieksterrein van de WVVOG.

De norm wordt u geleverd met een certificaat, getuigenis en het toevoeging 03034220.

Certificatenummer: 12-EN-01

Uitgegeven op 18 december 2017 tot 17 december 2022

Zie de aanvullende informatie N.B.S. de certificatieomschrijving en de toelichting van de EN ISO 50001 : 2011 ten tijde de aflevering van dit certificaat worden toegezonden.

Het op 18 december 2017 uitgegeven Certificaat Conformiteit van 18 december 2017 is opgesteld met toestemming van het Agentschap Reguleren van de Media.

Naam van de certificatieinstantie:
Bart Janssens
Verzitter Certificatiecommissie





“It always seems impossible until it's done.”
Nelson Mandela

6150 PV panels on the workshop Vorst (Brussel-south) (1,85 MWp)