

SNCF Energy Savings Program

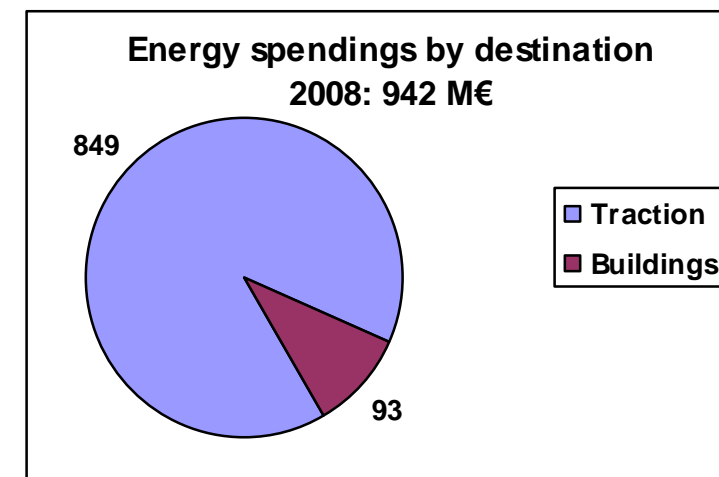
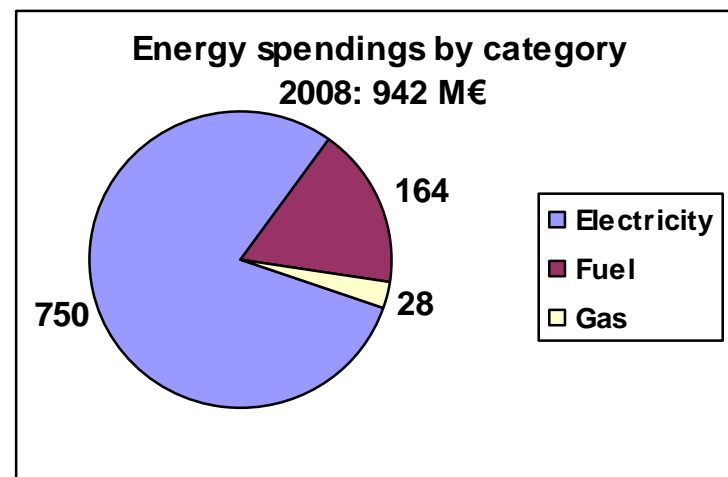


Dominique Vastel
Energy Efficiency Days, September 24th, 2009



New support towards energy savings for SNCF

- The context is favorable
 - Political backing: the French Government has charged SNCF's President to develop « ecomobility »
 - Legal background: decisions have been taken during the « Grenelle de l'environnement » conferences and are being implemented by Bills of law (Grenelle 1 and 2)
- Total SNCF energy spending: 1 Billion €



- Our ambition: to make Energy Savings a part of SNCF corporate policy, managed by the Business Units, instead of being the prerogative solely of technical experts



SNCF needs more precise information on its energy consumption. This is true for traction ...

- Electricity represents 80 % of SNCF's energy bill
- Electricity used for traction constitutes 82% of the traction energy bill
- The global forecast is fairly accurate (3% margin of error), but its exact breakdown by Business Units is impossible:
 - A consumption split between business units on the basis of Gr Tkm
 - Our estimations of engines consumption are based upon models set up in the 80's
 - The parked or idling trains consumption is not taken into account



... but also for buildings, workshops and stations

- 18 000 buildings covering 9 million m²
- 100 M€ in energy bills
- Due to the lack of local electric meters, monitoring the consumptions per building/occupants is impossible
- Energy savings cannot be measured
- Internal re-invoicing is based on allocation ratios which prevents any constructive budget discussions and the curbing of consumption
- And SNCF cannot always send legally incontestable invoices to third parties present in its buildings, such as concession holders, tenants, public facilities and services, etc.



A determined approach: a program with concrete targets and involvement of the Business Units

- Targets for the end of 2010
 - 5% reduction in traction energy consumption
 - 10% reduction in building and car driving energy consumption
- The conditions for success: providing the adequate organization and resources dedicated to Energy Savings
 - Nomination of a correspondent responsible for Energy Savings in each Business Unit
 - Change in accounting rules for 2009 so that those who save energy can benefit from it – all the more necessary when investments are financed directly by Business Units
 - A specific budget allocated to the Energy Savings Program, in particular to finance experiments



A Program focused on few initiatives, but with short term potential (1/2)

- 6 « Quick Wins »
 - ① Optimizing the 14 000 electricity subscription contracts
 - ② Obtaining Energy Savings Certificates
 - ③ Modifying parking and logistics practices of Rolling Stock
 - ④ Setting up managerial and communication actions to obtain energy savings
 - ⑤ Reinforcing the « eco-driving » program for the fleet of vehicles (cars and trucks)
 - ⑥ Improving the quality of processes at the filling stations



A Program focused on few initiatives, but with short term potential (2/2)

- 4 short-term actions
 - ⑦ Developing the metering system for electric traction
 - ⑧ Generalizing energy efficient systems for buildings
 - ⑨ Setting up energy efficiency diagnosis for each of the 20 Regional Business Units
 - ⑩ Specifying standards concerning building renovations
- 2 mid-term actions
 - Assessing the impact of train circulations on energy consumption
 - Organizing management projects on eco-driving for trains



Progress report on the implementation of the Energy Savings Program

- The current economical crisis reinforces the need to implement « quick wins »
 - Parking and logistics for Rolling Stock
 - Quality of processes at the filling stations
 - Managerial and communication actions to obtain energy savings
- 3 actions are pre-requisites for the success of the Program:
 - Energy efficiency diagnosis for each of the 20 Regional Business Units
 - Installing metering systems in electric Rolling Stock
 - Installing metering systems in buildings



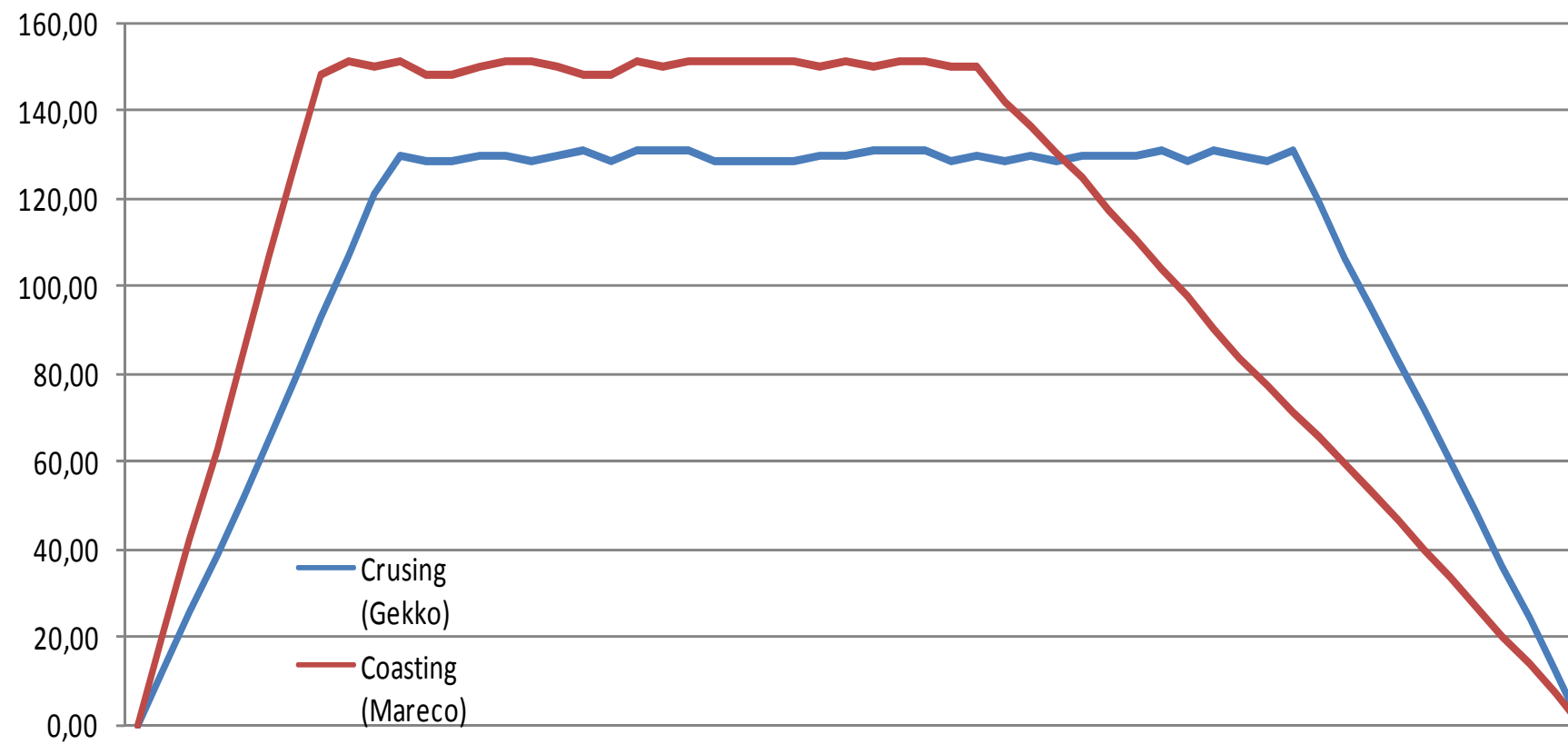
Traction energy efficiency



Four ways to reduce train energy consumption

- Energy metering, in order to implement energy savings actions (*we can save only what we meter*)
- Energy efficient driving
- Energy savings linked to parked trains
- Improving traffic fluidity

French drivers are trained in energy efficient driving with Mareco slots



Economic slot ("MARECO") with reference speeds on the driver's timetable

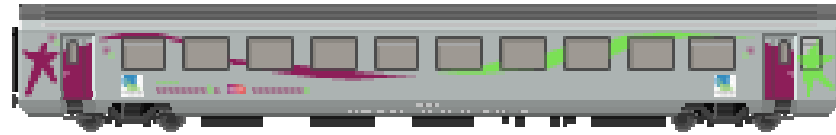
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	268.7	117 ME	BAYEUX PL D	12 57 12 58	1	
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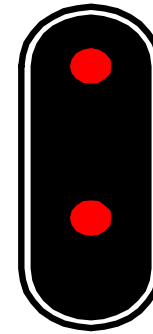
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Paris Cherbourg experiment : Energy consumption key figures



Additional coach

+12%



Additional stop

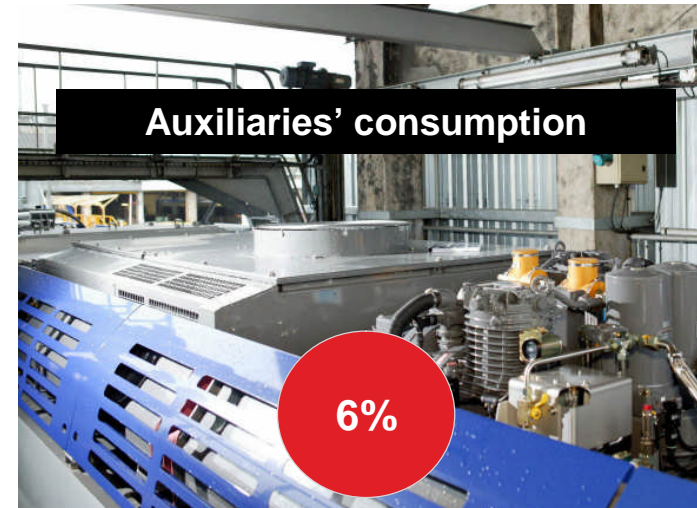
+8%

Non-economical driving



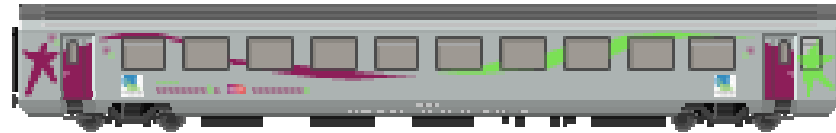
+3%

Auxiliaries' consumption



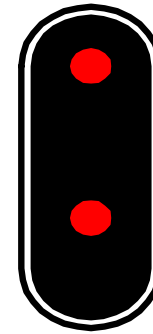
6%

Paris Cherbourg experiment : Energy consumption key figures



Additional coach

+12%



Additional stop

+8%

Non-economical driving



+12%

Auxiliaries' consumption



6%



An eco driving challenge

- Planned for November, with a team of Freight drivers
- Between Lyon and Thionville, with Alstom BB 37 000 equipped with meters with the support of two billing systems :
 - ERESS, the northern Europe system
 - SOCLE, the new RFF EMS
- The consumption of each train will be recorded during three months:
 - Average consumption of trains
 - Average consumption of each driver
- This procedure ensures traffic incidents are neutralized



An incentive operation to demonstrate the usefulness of metering systems and of energy efficiency driving



Parked trains

- An experiment conducted in the north of France, with an Alstom Z 24 500 travelling between Lille and Valenciennes has given the following results:
 - One hour of parking without reduced mode, consumes as much energy as 18 train-Km
 - Trains idling 16 hours in a station or in a garage, without the reduced mode: they consume as much energy as 294 train-km
 - Parked train consumption represents 59% of the daily consumption of a regional train in Lille
- A parked TGV with all its auxiliaries in use consume an average of 200 KWh per hour



At least 5% and up to 10% of savings expected by a better parked trains management



The new rules of network access defined by RFF in France

- Every traction unit, in service on the French railway network since the 10th of December 2006, has to be equipped with an on-board metering system
- Each non equipped traction unit will be charged with penalties:
 - RFF plans to apply an additional charge of 20% on electricity consumption
 - The exported electricity will not be taken into account
- Traction units operated before the 10th of December 2006 can be non equipped. Their consumption will be calculated as it is today, using breakdown keys



SNCF's traction units equipped or in the pipe

- Freight traction units
 - 59 BB 37 000 (since 2007 to be able to run in Germany), some of them are part of the ERESS experiment
 - 60 BB 36 000 et 36 300 (at the beginning of next year)
 - 16 BB 27 000 (SOCLE testing)
- Passenger traction units (part of SOCLE Testing)
 - 5 Z 21500 (TER Centre)
 - 5 interoperable TGV
 - 12 Atlantic TGV



157 traction units



The minimum SNCF park to equip to fit in with RFF rules

- 423 traction units operating between the 10th of December, 2006 and the 31st of December, 2009
 - One BB 37 000 is already equipped



422 traction units have to be equipped

- SNCF's rolling stock department recommends not to create sub parks in traction unit series, to optimize their maintenance
 - It is better to equip the entire series from which traction units were put into service before and after the 10th of December, 2006
 - Consequence: 230 traction units need to be added



652 traction units have to be equipped



Key points about traction units equipment with meters

- RFF imposes traction units equipment starting on the 1st of January 2010
- We have to launch the program before the end of 2009
- STI and CENELEC rules will impose accuracy levels for meters which are not available today on the market, especially for DC
- We have to set up an agreement with RFF, fitting STI and CENELEC rules