

ERESS-SUSDEF survey: trends and perspectives for railway energy in Europe

13 June 2018, Rome



FONDAZIONE
PER LO SVILUPPO
SOSTENIBILE

Sustainable Development Foundation

*Raimondo Orsini,
Sustainable Development Foundation*

Welcome to Rome! The city of...

GREAT FOOD



GREAT MONUMENTS



**GREAT...LOAD
FACTOR!**





Eress Forum 2018
Roma, Italy

Index

-  Picture of respondents
-  Energy Meters
-  DCS (Data Collecting System)
-  ESS (Energy Settlement System)
-  Perspectives for the railway energy system



■ Picture of respondents



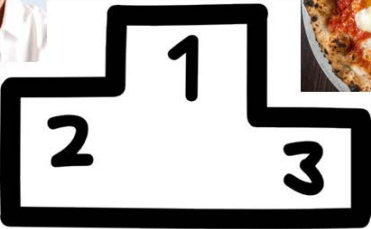
Same question of last year to railway managers: which of the following would you carry with you on a desert island?

But something has changed this year...

Charlize Theron/Brad Pitt

Energy Meter

Pizza



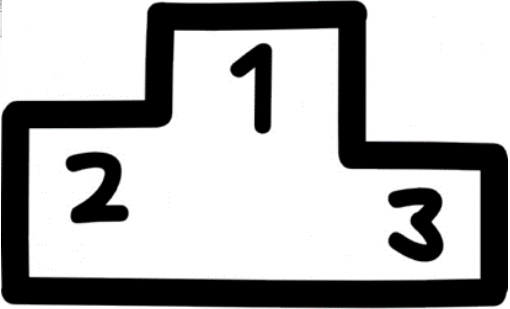
A podium with three steps labeled 1, 2, and 3. The number 1 is on the highest step, 2 is on the middle step, and 3 is on the lowest step.

RANKING 2017

THE WORLD CUP 2018

Energy Meter

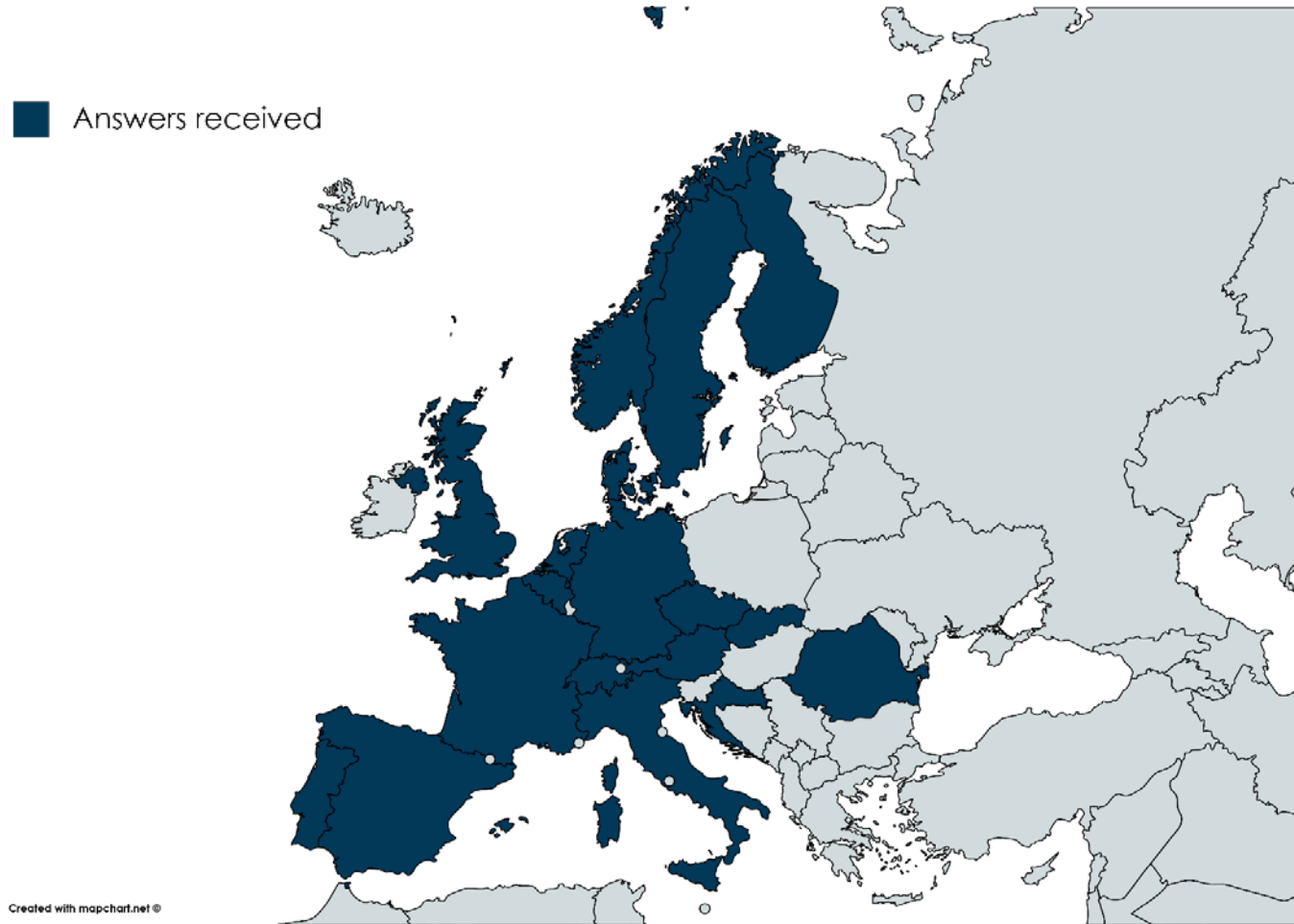
Pizza



A podium with three steps labeled 1, 2, and 3. The number 1 is on the highest step, 2 is on the middle step, and 3 is on the lowest step.

RANKING 2018

Received answers and covered countries

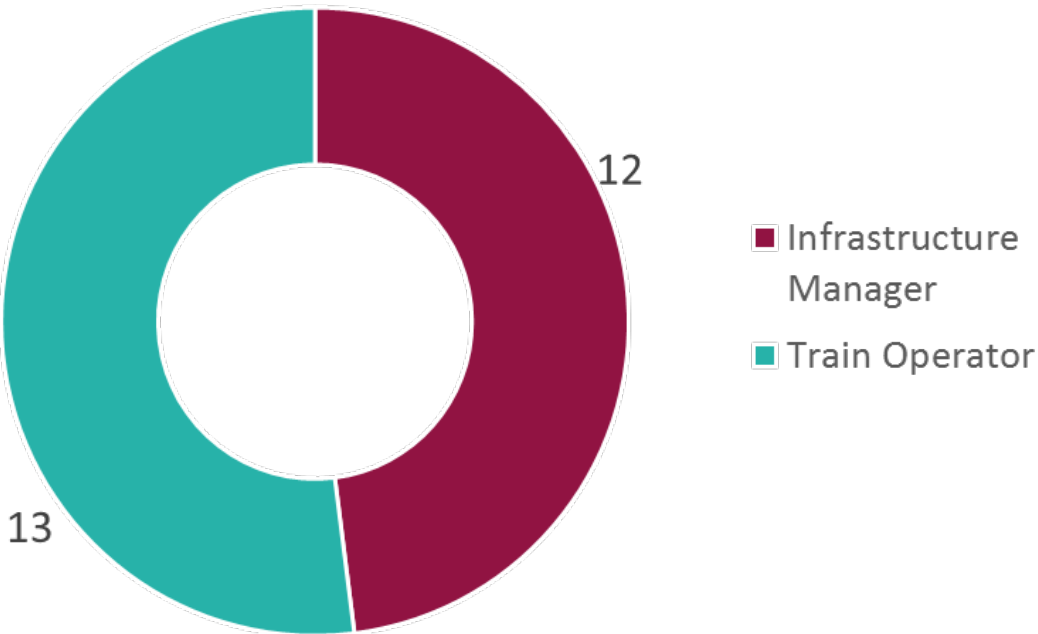


The survey consists of **20 questions** and it has been sent by email to energy managers belonging to different types of companies.

The report has been made up with the answers received from:

- **19 Countries**
- **25 Respondents**

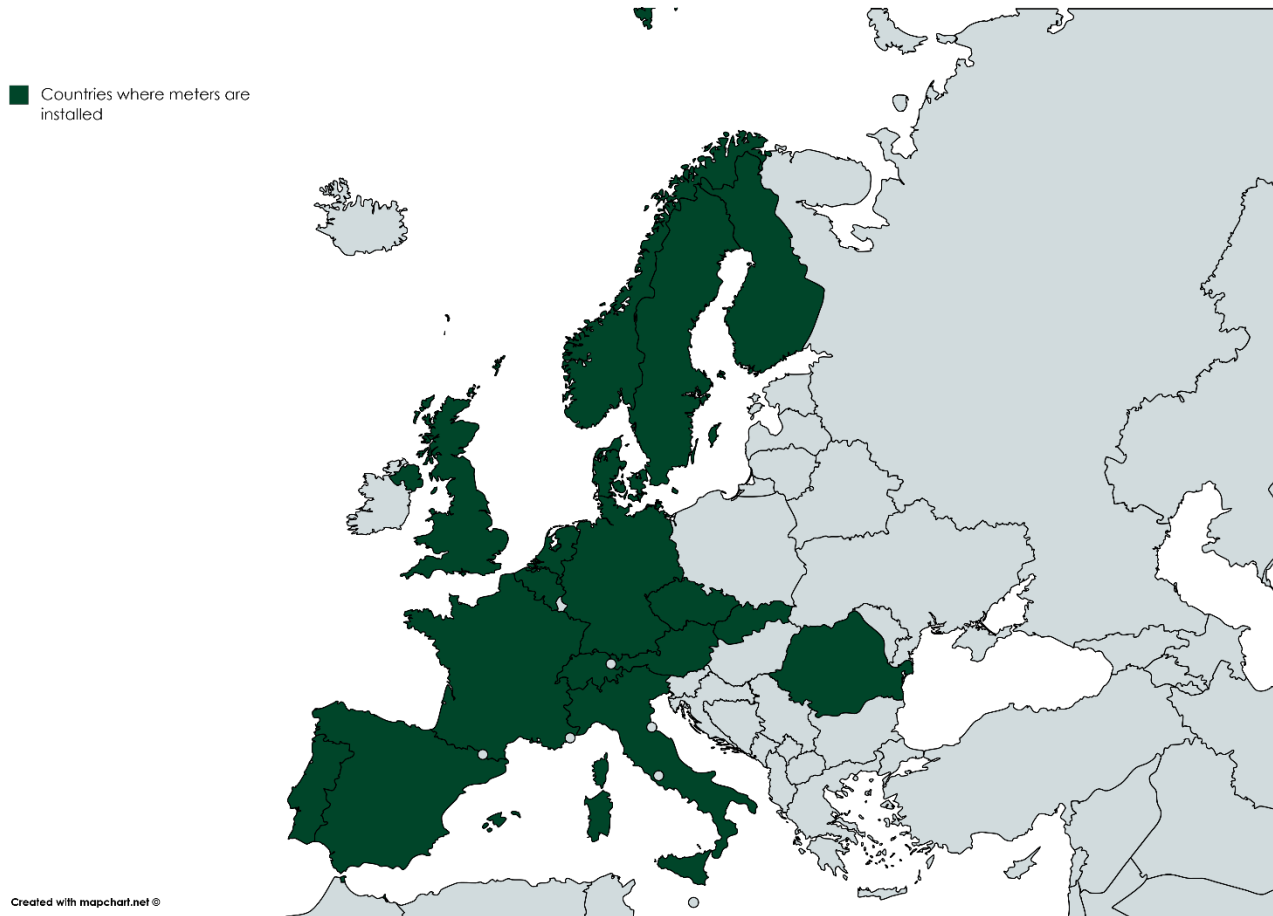
Where do you work? I work for...



Country	Infrastructure Manager	Train Operator	Total
Austria	1		1
Belgium	1	1	2
Croatia		1	1
Denmark	1		1
Finlandia	1	1	2
France		1	1
Germany		1	1
Italy	1	1	2
Luxemburg		1	1
Norway	1	1	2
Netherlands		1	1
Portugal		1	1
Czech Republic	1		1
Romania	1	1	2
Slovakia	1		1
Spain	1	1	2
Switzerland	1		1
Sweden	1		1
UK		1	1
Totale	12	13	25

- KEY ISSUE 1: Energy Meters

Do you have energy meters on trains in your country?



	No	Yes
Infrastructure Manager	0	12
Train Operator	1	12

↙

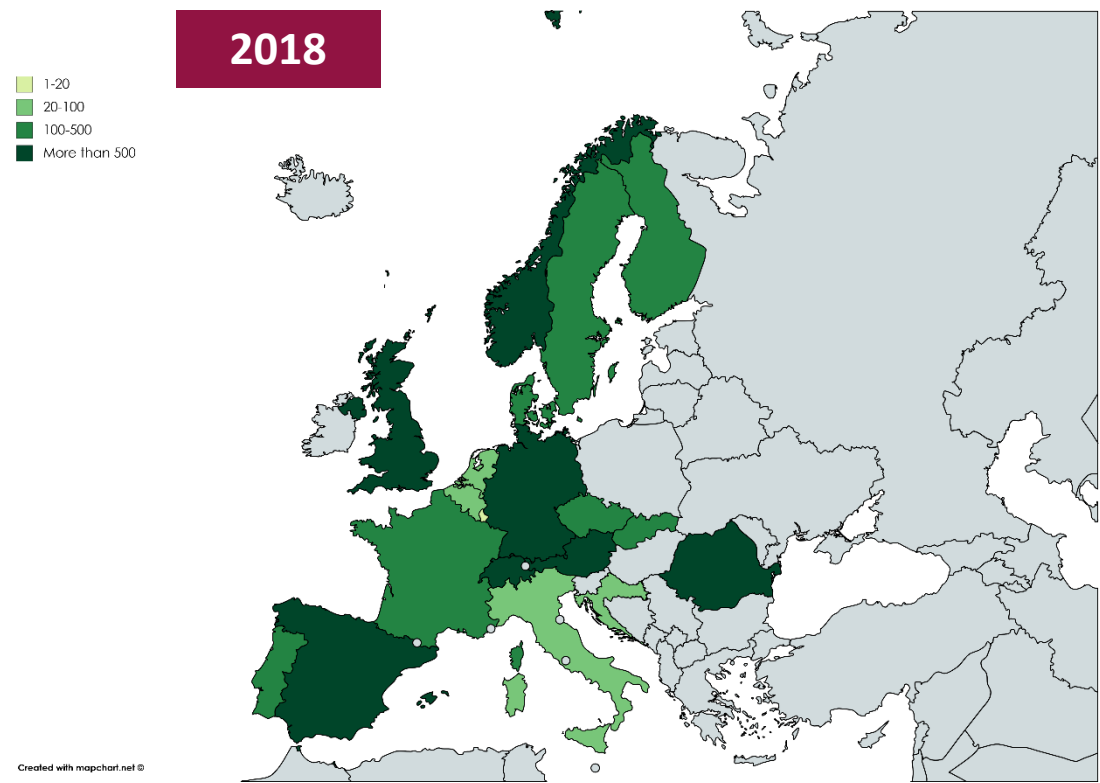
«When are you planning to start installing energy meters on train?»

- Croatian Train Operator: «Later»

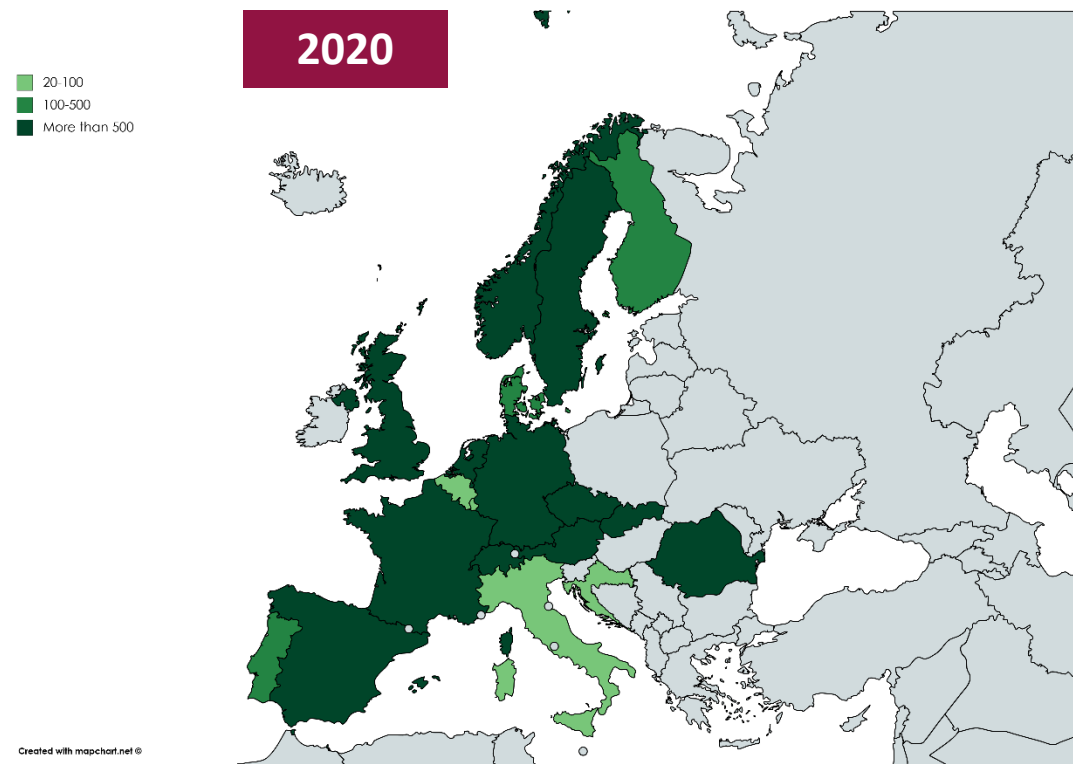


How many energy meters do you have today?

And how many do you expect in 2020?



Energy meters	2018
0	1
1-20	1
20-100	5
100-500	10
More than 500	8



Energy meters	2020
0	-
1-20	-
20-100	3
100-500	9
More than 500	13

Meters installed: ERESS survey 2017 vs. ERESS survey 2018

Who is going better?



Meters installed: ERESS survey 2017 vs. ERESS survey 2018

Country	1-20	20-100	100-500	More than 500
Austria				2017=2018
Belgium		2017=2018		
Croatia		2017=2018		
Czech Republic			2018	
Denmark			2017=2018	
Finland	2017			2018
France			2017=2018	
Germany				2017=2018
Italy		2017=2018		
Luxemburg	2018			
Netherlands		2017=2018		
Norway				2017=2018
Portugal			2018	
Romania				2017=2018
Slovakia			2017=2018	
Spain			2017	 2018
Sweden			2017=2018	
Switzerland			2017	 2018
UK				2017=2018

Meters installed: expectations for 2020

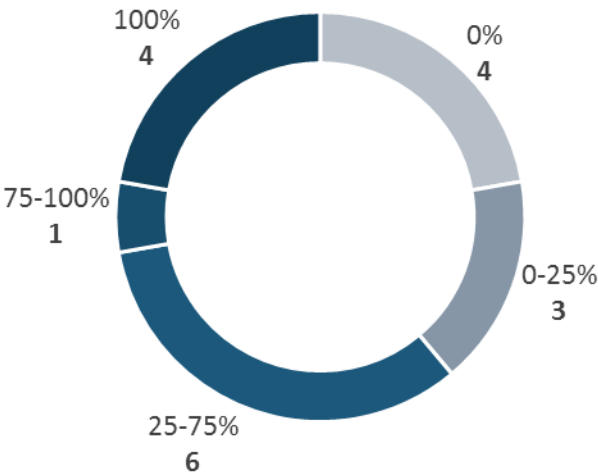
Country	1-20	20-100	100-500	More than 500
Austria				2018=2020
Belgium		2018	→ 2020	
Croatia		2018=2020		
Czech Republic			2018 → 2020	
Denmark			2018=2020	
Finland			2018=2020	
France			2018 → 2020	
Germany				2018=2020
Italy		2018	→ 2020	
Luxemburg	2018	→ 2020		
Netherlands		2018	→ 2020	
Norway				2018=2020
Portugal			2018=2020	
Romania				2018=2020
Slovakia			2018 → 2020	
Spain				2018=2020
Sweden			2018 → 2020	
Switzerland				2018=2020
UK				2018=2020

How many TSI compliant meters do you have in your country?*

**Open-ended question*

Country	(N° Energy Meters) N° TSI compliant Meters	Rough Percentage
Austria	(More than 500) 600	100%
Belgium	(20-100) 60	25-75%
Croatia	(20-100) -	0%
Czech Republic	(100-500) All	100%
Denmark	(100-500) 184	25-75%
Finland	(100-500) 160	25-75%
France	(100-500) 300	25-75%
Germany	(More than 500) 10	0-25%
Italy	(20-100) 0	0%
Luxemburg	(1-20) -	0%
Netherlands	(20-100) All	100%
Norway	(More than 500) 59	0-25%
Portugal	(100-500) None	0%
Romania	(More than 500) I don't know	-
Slovakia	(100-500) 480	25-75%
Spain	(More than 500) 100	0-25%
Sweden	(100-500) 300	25-75%
Switzerland	(More than 500) 500	75-100%
UK	(More than 500) 850	100%

TSI compliant meters
Number of Countries for Percentage Classes



What is the percentage of traction units equipped with meters today? And how many do you expect in 2020?

Country	0-24%	25-49%	50-74%	75-100%
Austria			2018	
Belgium	2018			
Czech Republic	2018			
Denmark				2018
Finland		2018		
France	2018			
Germany				2018
Italy	2018			
Netherlands	2018			
Norway				2018
Portugal			2018	
Romania				2018
Slovakia				2018
Spain			2018	
Sweden		2018		
Switzerland		2018		
UK			2018	

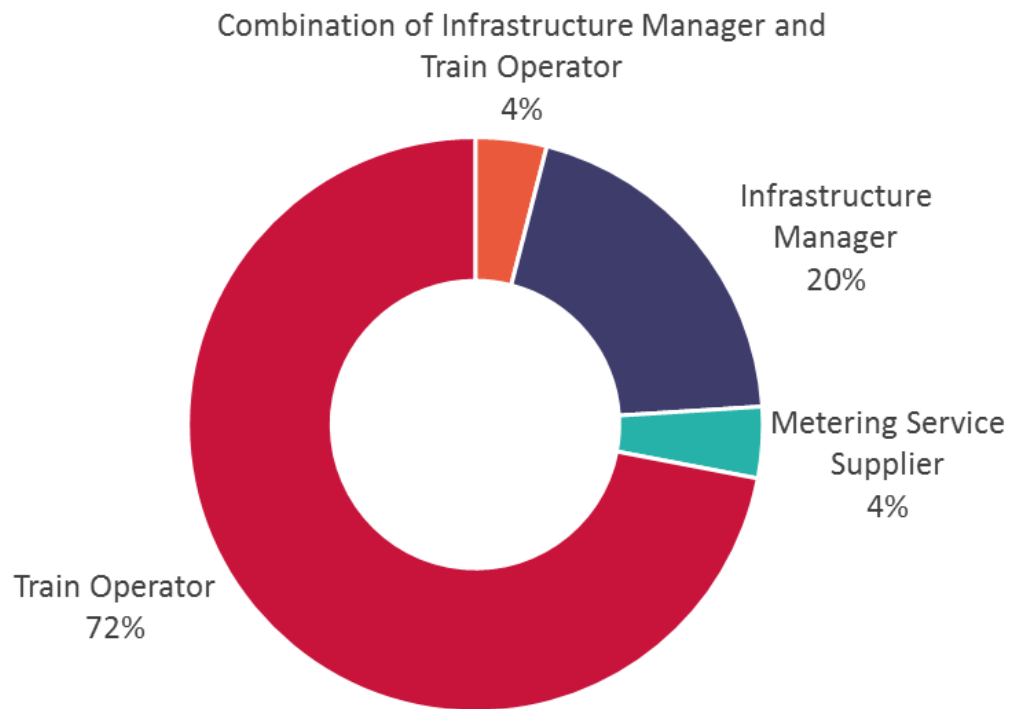
NOTE:
Luxemburg and Croatia did not provide any data about the percentage of equipped traction units

What is the percentage of traction units equipped with meters today? And how many do you expect in 2020?

Country	0-24%	25-49%	50-74%	75-100%
Austria			2018 	2020
Belgium	2018 	2020		
Czech Republic	2018 	2020		
Denmark				2018=2020
Finland		2018 		2020
France	2018 		2020	
Germany				2018=2020
Italy	2018=2020			
Netherlands	2018 		2020	
Norway				2018=2020
Portugal			2018=2020	
Romania				2018=2020
Slovakia				2018=2020
Spain			2018 	2020
Sweden		2018=2020		
Switzerland		2018 		2020
UK			2018 	2020

NOTE:
Luxemburg and Croatia did not provide any data about the percentage of traction units equipped.

Who is the owner of energy meters on trains in your country?



Train Operator

Belgium
Croatia
Denmark
Finland
France
Germany
Italy (TO's answer)
Luxembourg
Netherlands
Portugal
Romania
Spain
Switzerland
UK

Combination of IM and TO

Slovakia

Infrastructure Manager

Czech Republic
Norway
Sweden

Metering Service Supplier

Austria

Key Messages



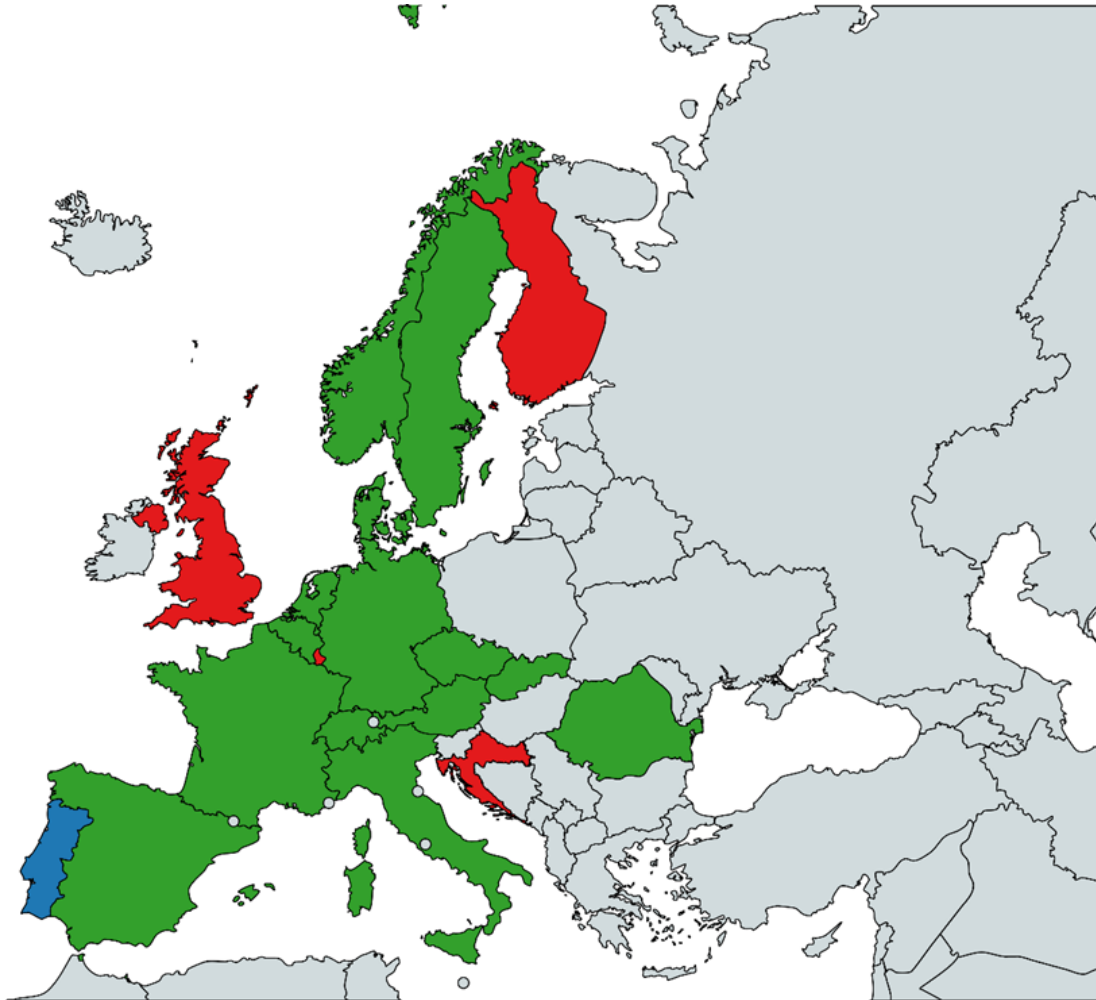
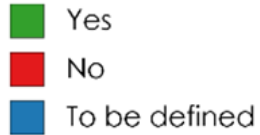
- Energy meters are present in all 19 countries.
- The number of installed meters is rapidly increasing everywhere: Spain, Switzerland and Finland have increased considerably in just one year (difference between 2017 survey and 2018 survey).
- Many companies expect to increase the number of energy meters within 2020, and particularly Finland, Netherlands, Switzerland, UK, Spain, Austria, Czech Republic, Belgium, France.
- Considering the percentage of traction units equipped with meters, 10 countries plan to cover almost 100% of traction units with meters in 2020



- It is very important to work internally (within the companies) to disseminate the knowledge of «metering culture» in the railway managers.
- Internal communication is an essential step for external results.
- Energy meters must be TSI compliant in order to uniform data ?
- Why Italy will has less than 25% traction units equipped with meters in 2020?

- KEY ISSUE 2: DCS (Data Collecting System)

Will your organization offer a DCS working in accordance with the new interoperable protocol?

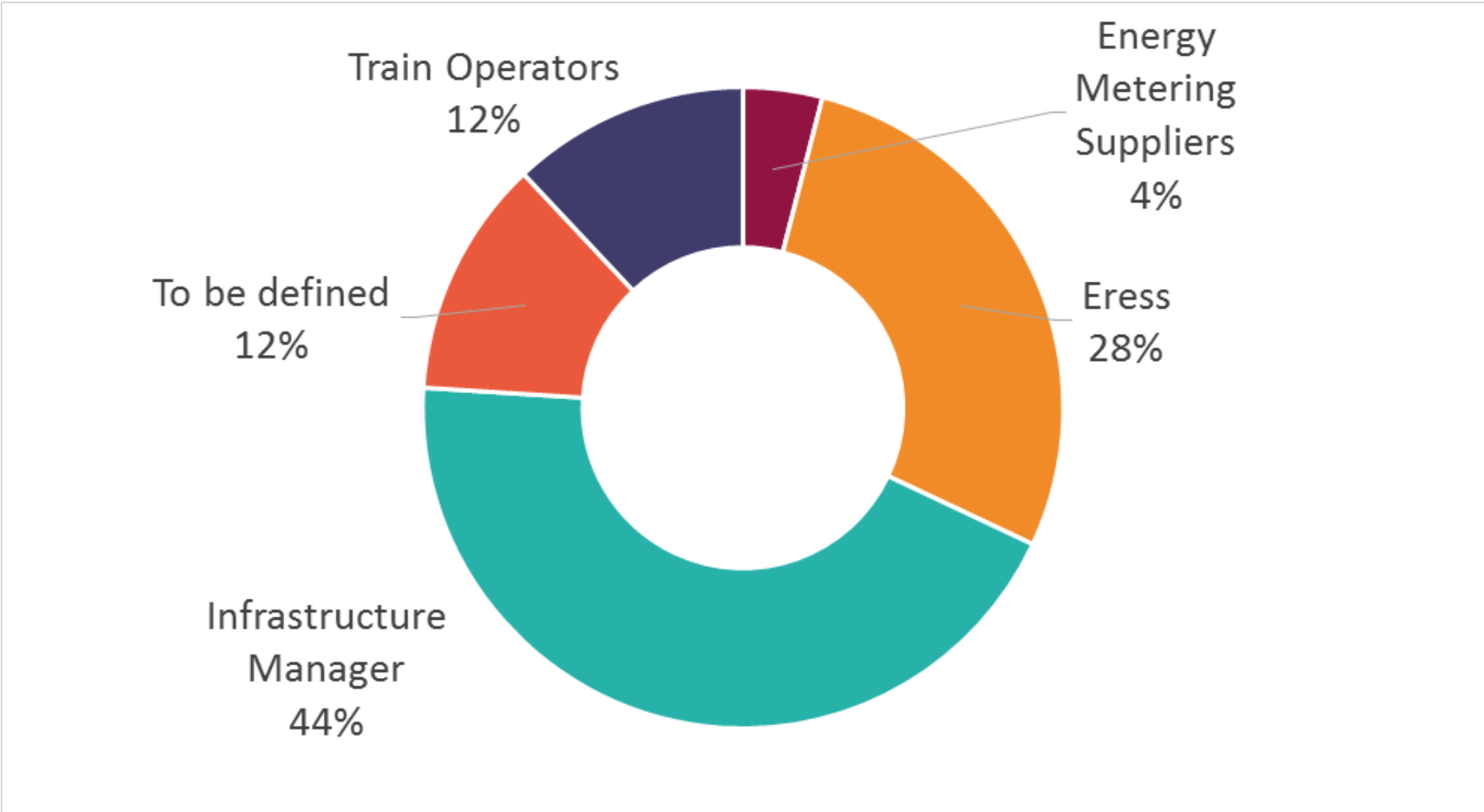


Who answered "no"?

Croatia	<i>Train Operator</i>
Finland	<i>Train Operator & Infrastructure Manager</i>
Luxembourg	<i>Train Operator</i>
UK	<i>Train Operator</i>

★ 81% of the “YES” respondents are planning to have such a DCS before 2022

Who owns or will own the DCS in your country?



Energy Metering Suppliers	1
Austria	1
Eress	7
Belgium	2
Denmark	1
Finland	1
Netherlands	1
Sweden	1
Switzerland	1
Infrastructure Manager	11
Croatia	1
Czech Republic	1
Finland	2
Italy	2
Norway	1
Romania	1
Slovakia	1
Spain	2
To be defined	3
France	1
Portugal	1
UK	1
Train Operators	3
Germany	1
Luxemburg	1
Romania	1

If there are installed meters, which is the most important challenge?

Infrastructure Manager	RANKING	Train Operator
 Validating that the data coming from energy meters is correct	1	 Validating that the data coming from energy meters is correct
 Allocating this data to the correct country or area	2	 Allocating this data to the correct country or area
Exchanging data inside the country for billing purposes	3	 Exchanging data inside the country for billing purposes
 Exchanging data internationally for billing purposes	4	Exchanging data internationally for billing purposes

Key messages

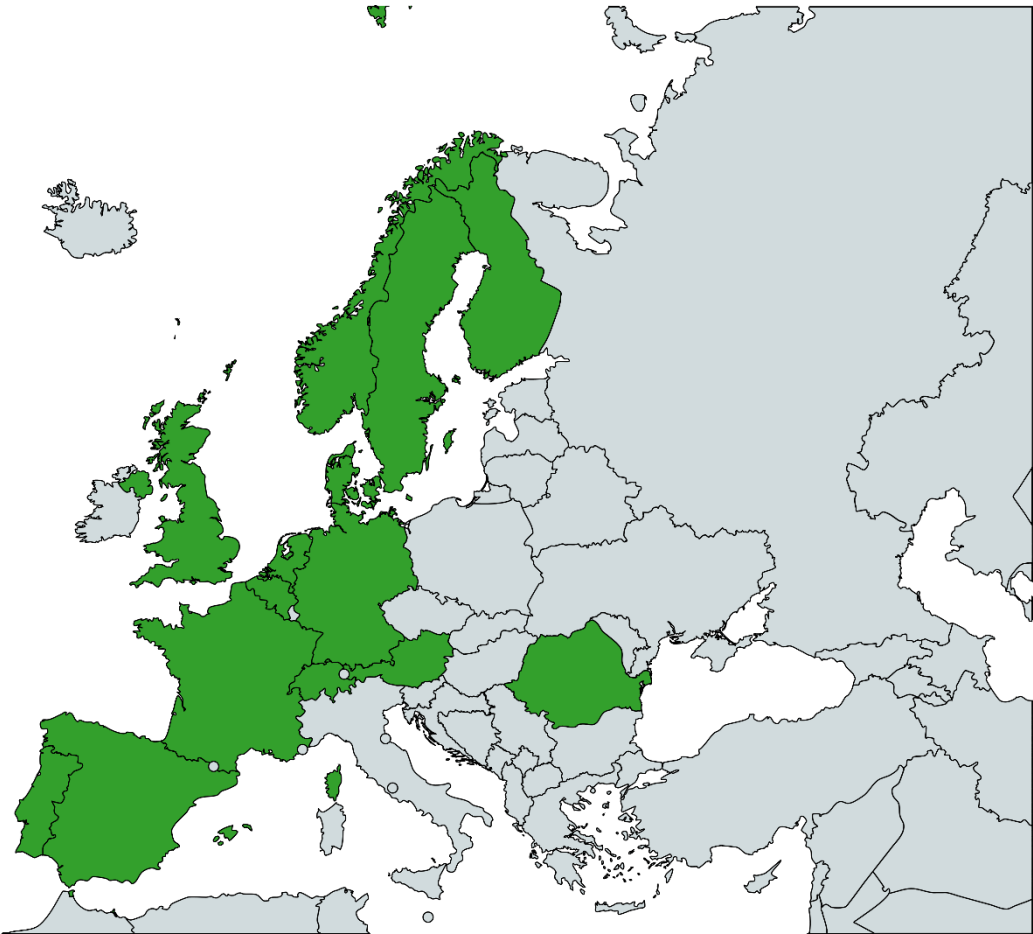


1. Almost all countries have decided to develop and run a DCS in the coming years.
2. Infrastructure manager will be in most cases the owner.
3. ERESS is «well positioned».
4. The validation of data coming from meters and correct allocation is perceived by both IM and RU as the main challenges.
5. In particular, more than 65% of railway companies managers gave priority to these issues.

■ KEY ISSUE 3: ESS (Energy Settlement System)

Do you have an Energy Settlement System to correctly handle metering data from trains for billing purposes?

Yes

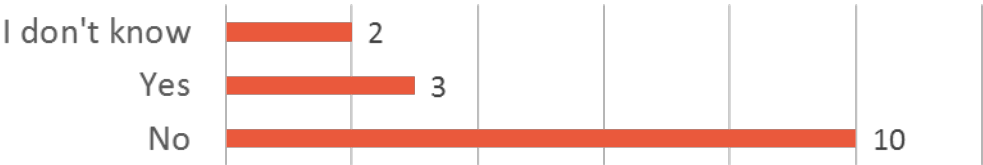


No (8):

Belgium	<i>Train operator</i>
Croatia	<i>Train operator</i>
Italy	<i>Infrastructure manager & Train operator</i>
Luxemburg	<i>Train operator</i>
Czech Republic	<i>Infrastructure manager</i>
Romania	<i>Train operator</i>
Slovakia	<i>Infrastructure manager</i>
Spain	<i>Infrastructure manager</i>

For those who answered YES:

“Are on-board energy meters in your country mandatory for international traffic?”



Key Messages



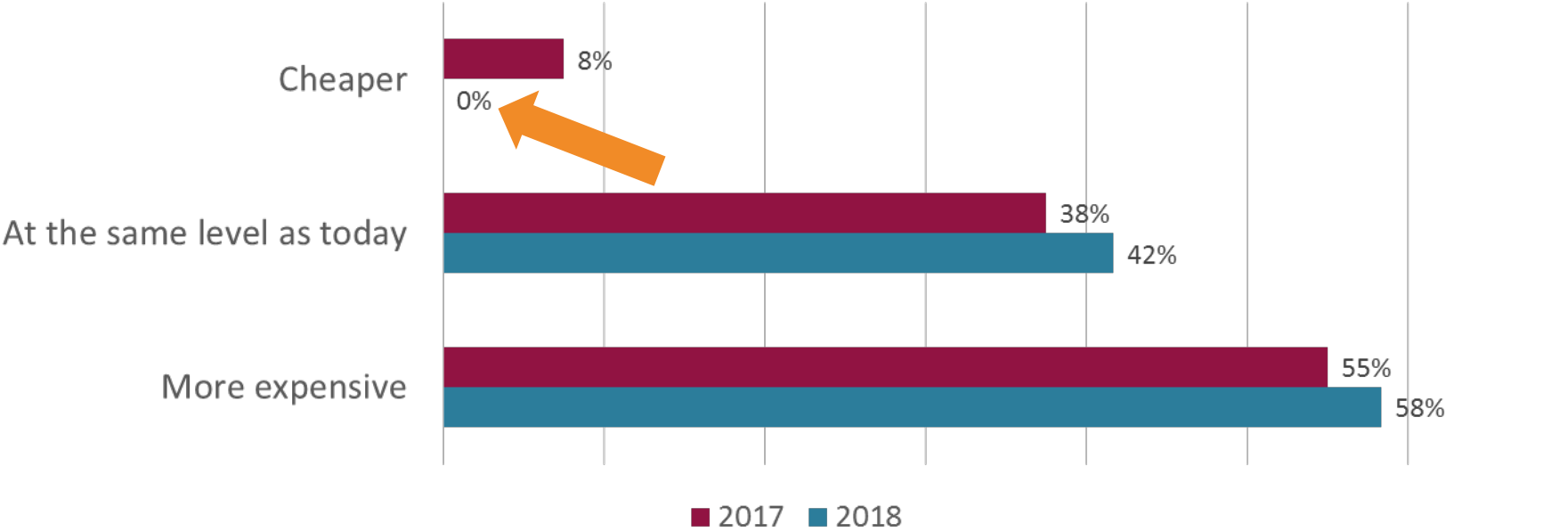
1. Today 60% of respondents declares to have Energy Settlement Systems.
2. In 2020 this number it is expected to reach 72%.



1. It is very important to work more (within the companies) to develop a better knowledge of ECS with managers (what is ECS? Why is it strategic ? Which opportunities can deliver in 2020? Etc.).
2. Internal communication is an essential step for external results.

- KEY ISSUE 4: Perspectives for the railway energy system

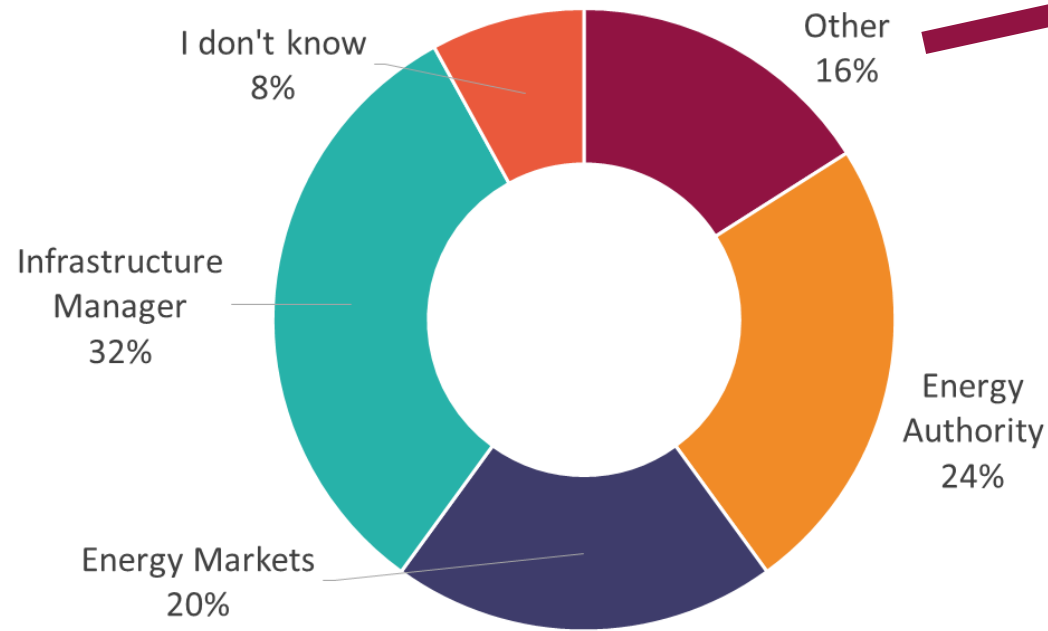
In the next 5 years railway energy prices will be...



Detail
in 2018

	At the same level as today	More expensive	N.a.	Total
Infrastructure Manager	6	5	1	12
Train Operator	4	9		13

Who defines the railway prices in your country?



Other:

- Railway Authority
- Cooperation between the Energy and Railway Authorities
- Incumbent operator & infrastructure Manager & Energy Providers

How do you think railway energy in your country will look in 2025?

Infrastructure Manager	RANKING	Train Operator
   		       
A Data Collection System (or systems) in place	1	A Data Collection System (or systems) in place
Non-discriminatory railway energy distribution tariffs ←	2	National rules will still regulate the railway market ←
An Energy Settlement System in place handling metering data from trains	3	An Energy Settlement System in place handling metering data from trains
Traction energy bills based on real energy consumption	4	Traction energy bills based on real energy consumption
More Train Operators running in the country	5	More Train Operators running in the country
Transparency of railway energy prices (open market for energy also in the railway market)	6	Transparency of railway energy prices (open market for energy also in the railway market)
Free choice of energy suppliers for Train Operators or direct access to the energy market	7	Free choice of energy suppliers for Train Operators or direct access to the energy market
National rules will still regulate the railway market ←	8	Non-discriminatory railway energy distribution tariffs ←

Which issues will represent the biggest challenge for having competition in your country?

	2020	Ranking	2025	
	Having installed energy meters on all trains	1	Having installed energy meters on all trains	
	Data Collection System in place ←	2	National regulation	
	National regulation	3	Energy Settlement System in place handling metering data from trains	
	Energy Settlement System in place handling metering data from trains	4	Transparency of railway energy prices	
	Transparency of railway energy prices	5	Data Collection System in place ←	

Key Messages



1. The data collection system is perceived as the main challenge now, but the main opinion is that in 2025 **it will be perfectly running**.
2. Transparency of railway energy prices is the most unlikely issue.



1. 54% of respondents is expecting an higher cost of energy in the future.
2. None of the respondents is expecting a cheaper cost of the energy in the future.

Conclusion:

Map of the Roman Empire at its peak



If the Romans had also built the railways...

...probably the issue of interoperability would have already been solved!

ERESS CONFERENCE 117 b.C.



Thanks for the attention!

13 June 2018, Rome



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