



# DSO's METHANE EMISSIONS CALCULATION METHODOLOGY *GRDF METHOD PER EVENT*

Speaker : Guillaume Virmaux (GRDF)

Authors: Philippe Auvray (GRDF), Estelle Courtier-Arnoux (GRDF), Sophie Galharret (GRDF), Victor Thévenet (GRDF), Guillaume Virmaux (GRDF)

HOST ASSOCIATION



PROUDLY SUPPORTED BY



HOST PARTNERS



PRINCIPAL SPONSORS



# 1- Who is GRDF (Gaz Réseau Distribution France) ?



**The largest gas distributor in Europe operating 200 000 km of network**



**1 million gas smart meters already rolled out  
11 million to be installed by 2023**



**11 million customers in France  
43 biométhane injection plants operated by GRDF  
network (out of 50 in France as of April 2018)**

# 2- Why measuring for CH4 emissions ?

## Key World data for CH4

**20% GHG emissions**  
(100 years global warming potential)

**CH4 is the 2<sup>nd</sup> contributor to GHG emissions**

Source: IPCC

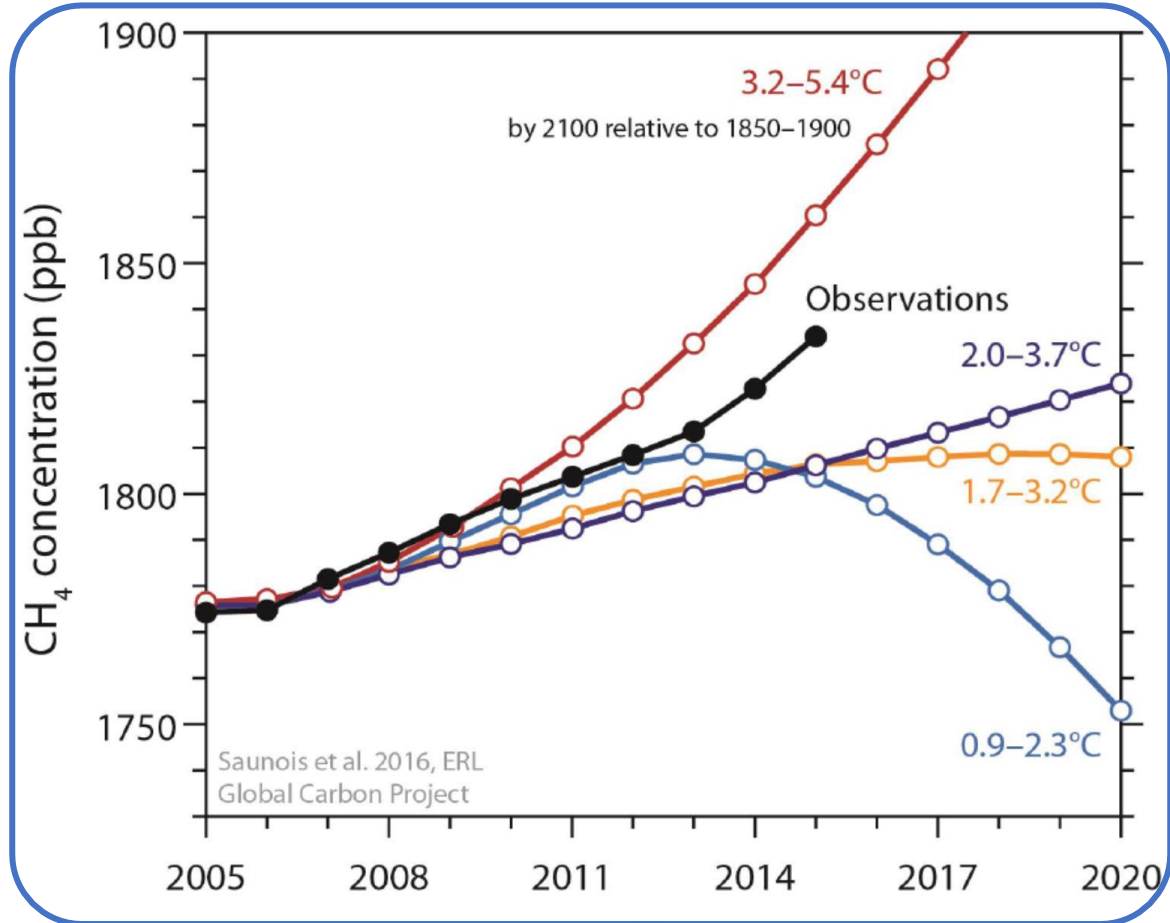
## Key data in France on CH4

**13% of GHG national emissions**

**Natural gas distribution grids were responsible of 1% of national CH4 emissions in 2015**

Sources : « Chiffres clés du climat », CGDD, DGEC, I4CE et CITEPA

## There is a clear increase in global CH4 emissions since 2014



Concentration of methane in the atmosphere by 2020, compared to IPCC projections increase in temperature by 2100

### 3 - DSO methane emissions calculation methodologies (1/5)



- In Europe, there are two methodologies that are currently in the process of being certified by the European Gas Research Group (GERG):

**The historical  
« linear method »**

**The method  
« per event »**



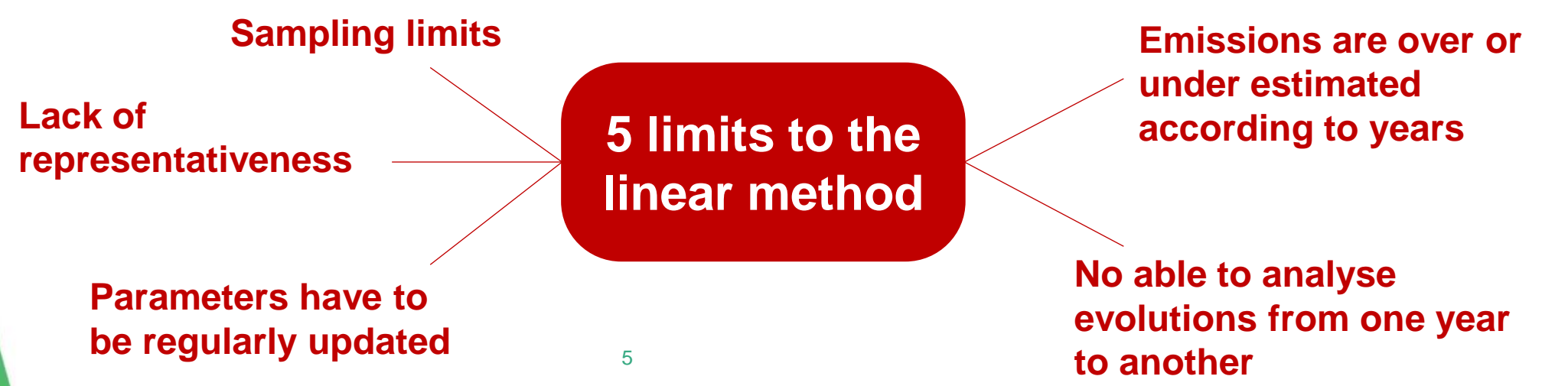
## The historical « linear method » or « method per km »

- Total emissions are estimated from a linear emissions factor (EF), in volume of natural gas leaked per km per year.
- The EF factor is evaluated from emissions measurements on a small portion of the network over a monitoring period.

$$EF = Q \cdot t \cdot N \cdot km$$

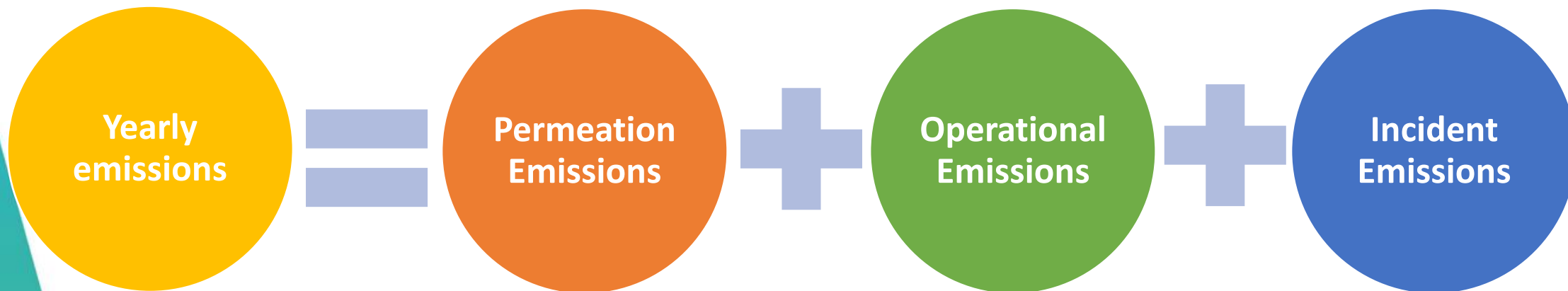
Q: emission rate  
N: average number of leaks per km

t: lifetime of a leak  
Km: number of km



## 2- DSO methane emissions calculation methodologies (2/4)

The method « per event » : a step forward to pilot emission reductions



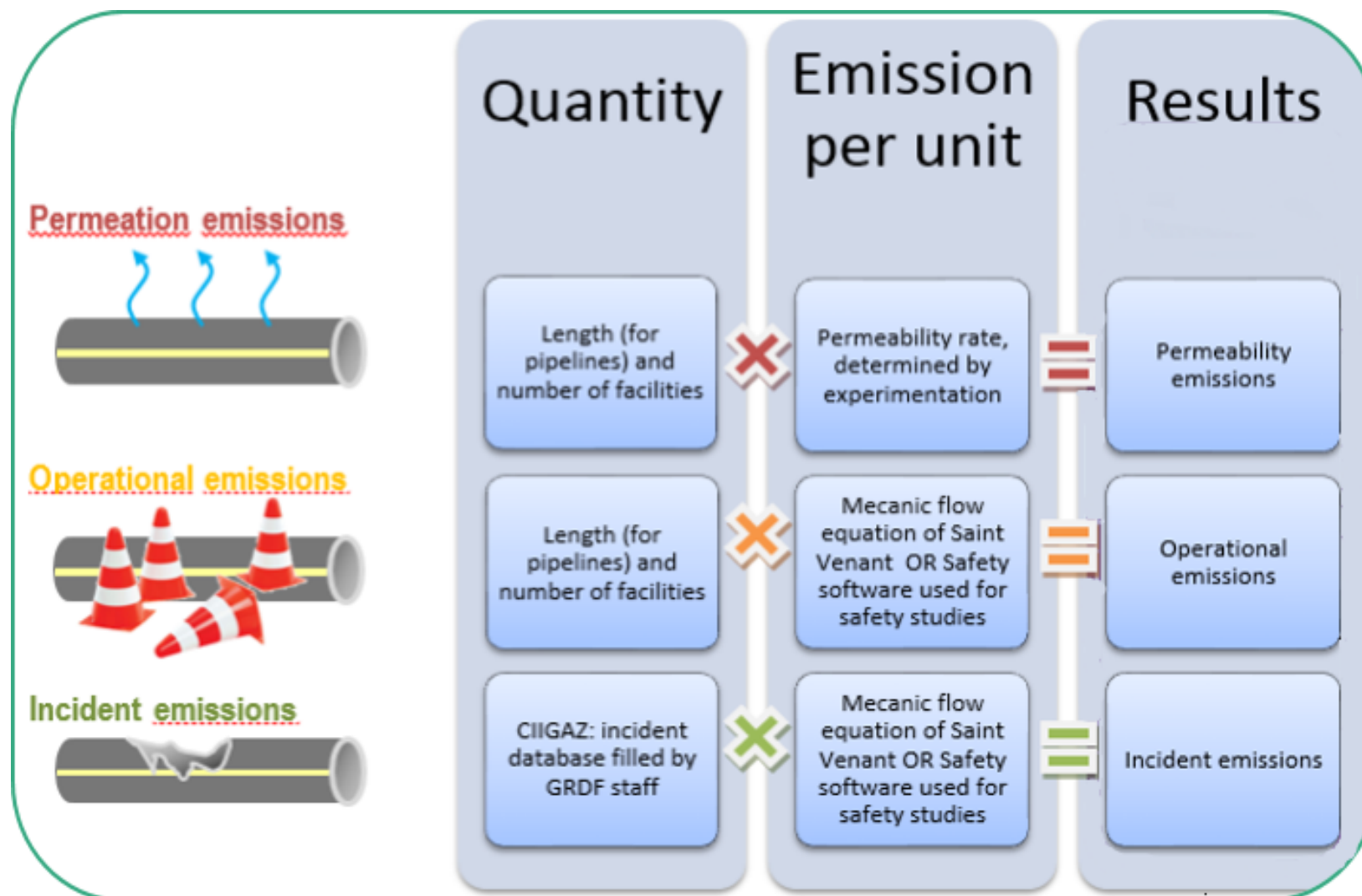
Due to pressure conditions, natural gas migrates through polymers of polyethylene films by a process of “dissolution diffusion”

During operation on grids, the natural gas contained in facilities is evacuated

It includes incidents from external responsibility (works on water grid) and those entering in GRDF responsibility (corrosion)

## 2- DSO methane emissions calculation methodologies (3/4)

The method « per event » : how to calculate the three types of emissions ?



## 2- DSO methane emissions calculation methodologies (4/4)



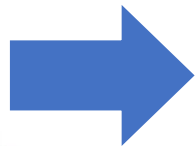
27th WORLD GAS  
CONFERENCE | JUNE 25-29  
WASHINGTON DC | 2018

The method « per event » provides us with key information

Methane Emissions (kt)	2017
Permeation	0.11
Operations	0.05
<b>Incidents</b>	<b>19.99</b>
<b>TOTAL – Résultats</b>	<b>20.16</b>

Source: GRDF

- The method per event allows us to differentiate between the incidents types.
- Network damages account for 85% of the total CH<sub>4</sub> emissions, whereas they only represent 19% of total network damages.



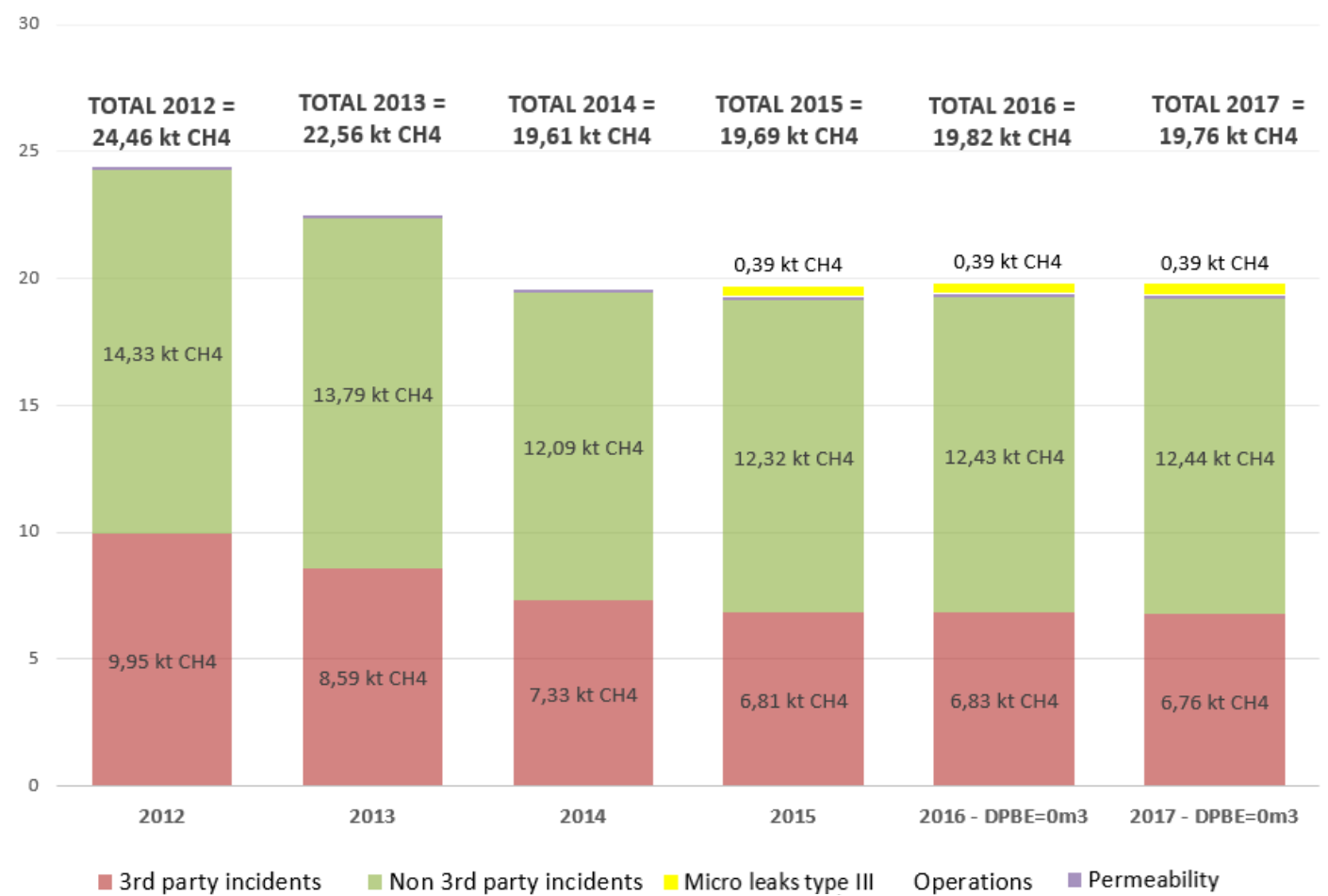
**The method per event allows GRDF to better analyze emission factors and to take accurate action to reduce them.**

For instance, time of response has been reduced and early actions to stop gas flow have been implemented.



# 2- DSO methane emissions calculation methodologies (2/3)

The method « per event » : CH4 emissions have dropped by 19% since 2012 in France



0,40 kt of CH4 emission avoided thanks to excess flow valve in 2016 and in 2017 (DPBE=0%)

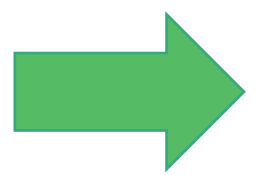
Micro leaks type III have a very low intensity. They are detected by GRDF's SLM Program and monitored over the year.

Source: GRDF



### 3- Key conclusions: Why using the method per event ?

- 1 Allows better transparency and representativeness
- 2 Constitutes a powerful tool to pilot network safety and reduce CH4 emissions
- 3 Replicable to other DSOs thanks to GRDF's typical value of operations and incidents events
- 4 Biomethane production is a promising lever to reduce methane emissions of both agricultural and gas sectors



**GRDF recommends to include the method per event among best practices spread in the DSOs community and in any potential future international guidelines**

# Thank you for your attention

Email - [guillaume.virmaux@grdf.fr](mailto:guillaume.virmaux@grdf.fr)

 - @GVirmaux