



Le réseau
de transport
d'électricité

Transition to eco-friendly power networks

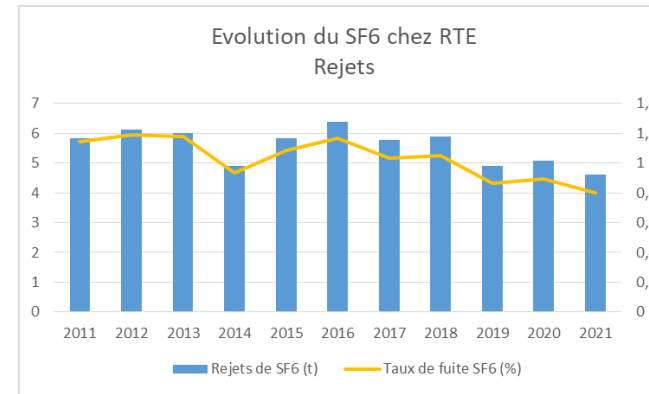
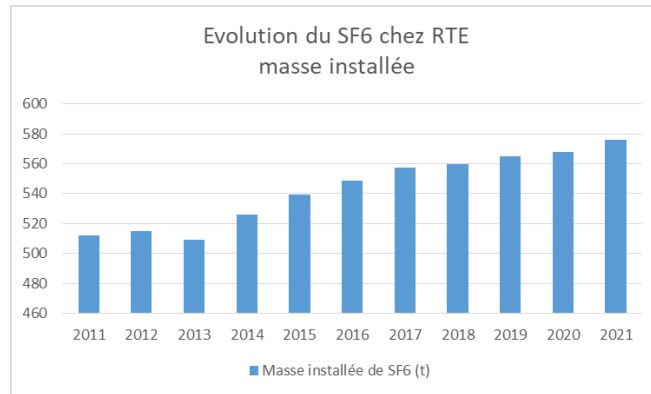
Focus on RTE's SF₆ strategy

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RTE's SF₆ context

Equipment	Quantity	Installed Mass (2021 tons of SF ₆)	Leakage (2021 tons of SF ₆)	Leakage rate (2021)
GIS & others	160 (17 600 compartments)	419	3,48	0,8%
Circuit breakers	13 000 (34 500 poles)	159	0,77	
Leakage during maintenance operations	-	-	0,37	



GWP of SF₆: 23500



- 1- Transition to eco-friendly solutions (SF₆ free)
- 2- Reduce leakage of installed fleet

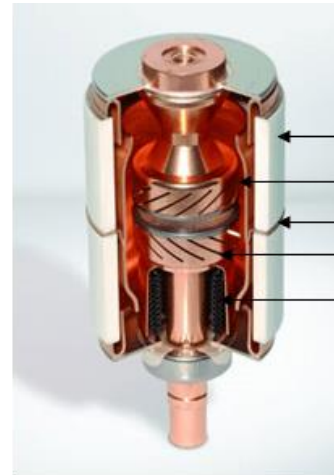
Transition to SF₆ free solution

RTE is conducting a **global approach lead by Life Cycle Analysis:**

- to compare the global sustainability of manufacturer proposed solutions (AIS vs GIS, Fluronitril vs Vacuum vs SF₆)
- not only on SF₆ topics (best transformer size to optimize losses, mineral vs vegetal oil, ...)

SF₆ actions:

- No longer use of SF₆ in measurement and power transformers
- When available, use of GIS SF₆ alternatives
 - **1 145kv GIS installed at Grimaud (~1t of g3 (fluronitrile tri-mix)) - 2 years - good return on experience**
 - **New frame contract (2023)**
- **100kV circuit breakers SF₆ free deployment**
 - Vacuum
 - O₂/CO₂
 - Fluoronitrile tri-mix
- Support to manufacturer initiatives (EU LIFE projects)



Coupe d'une ampoule à vide

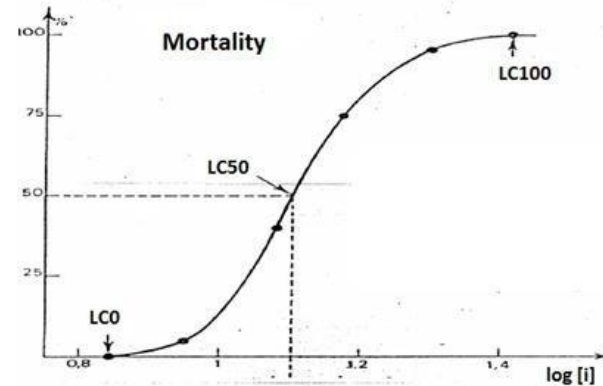
1. Isolateur en céramique - 2. Contact fixe
3. Brasure métallique - 4. Contact mobile
5. Soufflets métalliques



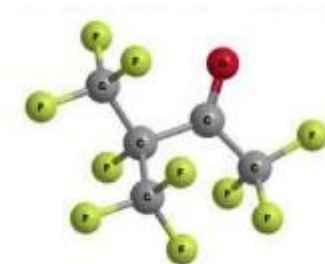
Transition to SF₆ free solution

Eco-assessment of alternative solutions !

- Toxicity (LC50 analysis) of fluronitrile trimix
 - For Workers
 - Done (PPE identified and validated)
- Vacuum Xray emissions
 - Simulation + measurement
 - French legal installation process (ASN)
 - Done
- Ecotoxicity of gas mixes
 - Work in progress
- Compare to SF₆



Ensure not to replace SF₆ by global worse solution
Ensure to avoid later ban



Reduce leakage

RTE Doesn't forget installed SF6 mass!

- RTE monitoring pressure deployment
- RTE R&D led to new GIS sealing solution (patent process ongoing)
 - First deployment 1 year ago
 - Laboratory aging tests
 - Easy and low price deployment
- R&D on process for AIS circuit breakers sealing solutions

