

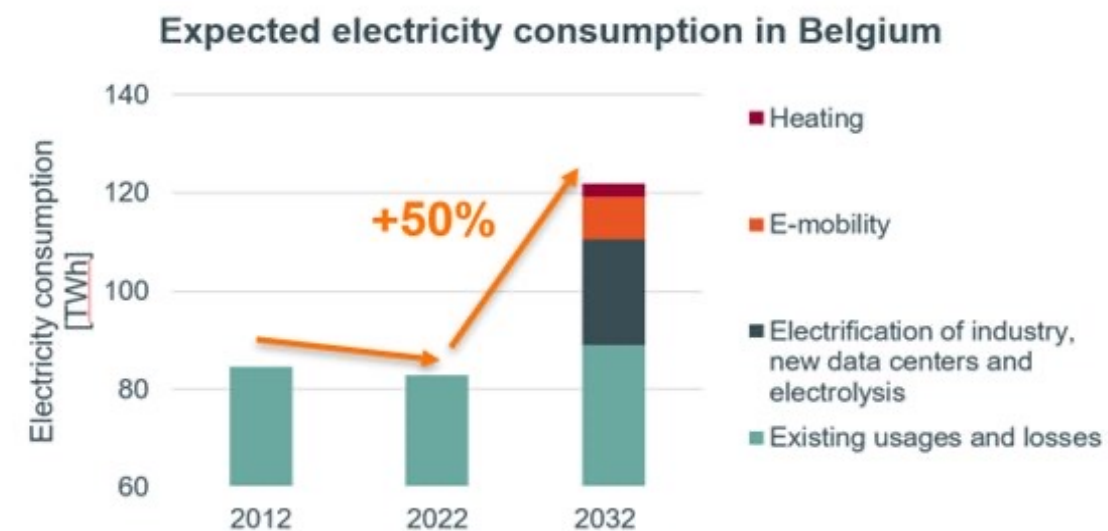
Circularity strategy?

The transition from a linear way of operating the high voltage grid to a circular operating model

25/09/2025 | RGI – ICA - Géraldine Wahis

General context: grid expansion, interconnections, renewables integration, electrification

Expected changes in the energy landscape



By 2032



Solar PV

x2.2



Onshore Wind

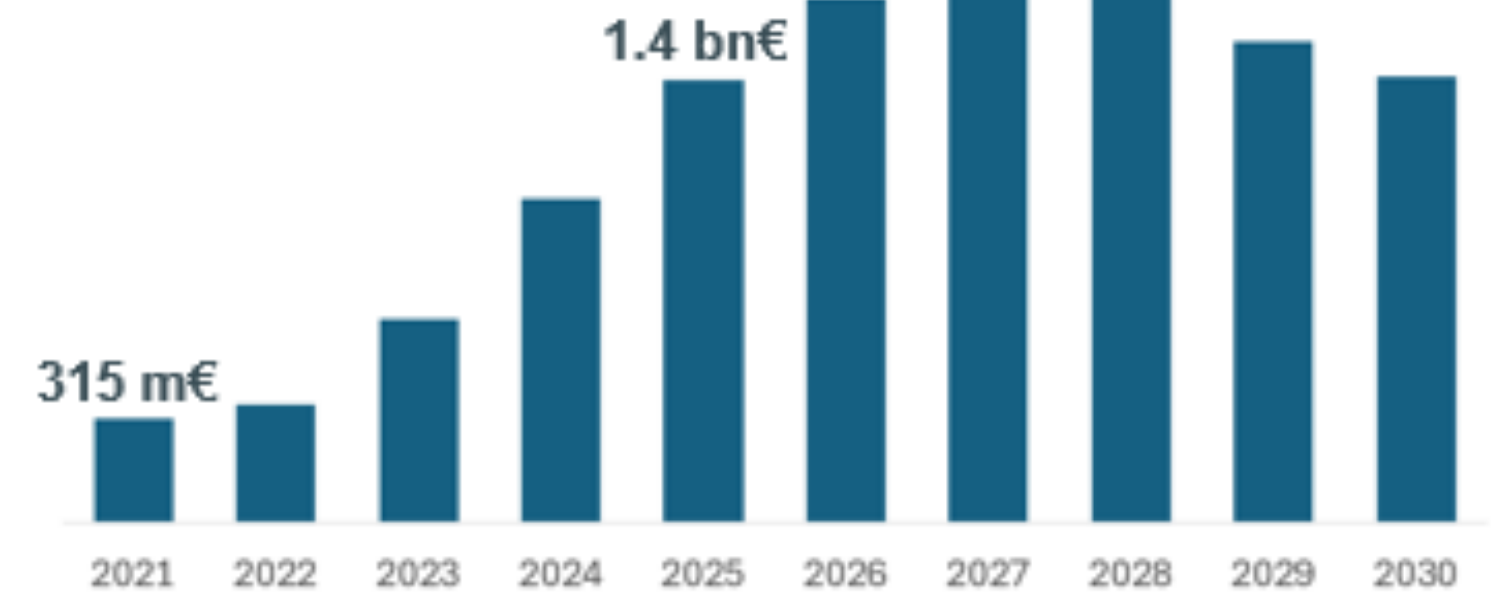
x2.1



Offshore Wind

x2.5

ETB annual average CAPEX evolution*



*estimation for illustration purpose

General context: Elia Group's challenges from 2025 onwards

AFFORDABILITY

Regulators and clients are requiring for **costs** to be kept **as minimized as possible**



FOOTPRINT

Elia Group must reduce the environmental footprint to **align with regulations** (e.g. CRMA, CSRD) and **certifications** (e.g. ISO14001, SBTi), starting with steel.



SUPPLY CHAIN

Copper faces scarcity risk: global demand will surpass supply by up to 11% in 2030*



CSRD audit 2024 : lessons learned

Elia is an urban mine, consuming and scrapping huge quantities of raw material

- **Huge quantities of strategic raw material** delivered in 2024. Great dependency on steel, aluminum and copper. Increase expected in the coming years with Princess Elisabeth island, Ventilus, and Boucle du Hainaut.
- **216,882 tons of waste** generated, by our contractors on work site on ETB's demand, representing 98% of our total waste generation.
- **21% of our waste generation was not recycled** in 2024 and has been disposed.

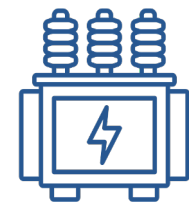
Reporting on recycled raw material

Initial Class Description	Py2024 ETB	Py2024 50Hertz	UNIT	Material Class	Copper (t)	Aluminium (t)	Steel	Magnetic steel	SFE (t)	Oil (t)	Iron
Large TFO											
Large TFO- Sr ≥185 MVA or Um ≥245 kV_2b6	0	0	pcs	HTPO10301	58.00		16.00	34.00		70.00	45.00
Large TFO- Sr ≥185 MVA or Um ≥245 kV_3a	0	0	pcs	HTPO10302							
Large TFO- Sr ≥185 MVA or Um ≥245 kV_3b	2	0	pcs	HTPO10304	24.20		9.20	52.00		40.00	30.00
Large TFO- Sr ≥185 MVA or Um ≥245 kV_3b3	0	0	pcs	HTPO10306	72.40		21.60	95.50		78.00	55.00
400KV 300MVA Transformer Ersatztrafo	0	1	pcs	n.a.	43.00			110.00		73.00	
Netztransformator Tr412 400MVA (5.4)	0	1	pcs	n.a.	66.00			145.00		73.00	
400KV 200MVA SF6 Transformator (Tr414)	0	1	pcs	n.a.	40.00			100.00		75.00	
OFFSHORE Transfo 400 MVA (SMIT)	0	0	pcs	n.a.	47.20			165.75		100.00	
OFFSHORE Power transfo 400 MVA (Siemens)	0	0	pcs	n.a.	51.98			106.78		71.00	
	48.40			Total ETB	48.40	0.00	18.40	104.00	0.00	80.00	60.00
				Total 50Hertz	149.00	0.00	0.00	355.00	0.00	221.00	0.00
Medium TFO											
Medium TFO - 50 <Sr <185 MVA_2b2	0	0	pcs	HTPO10202	48.70					35.10	24.30
Medium TFO - 50 <Sr <185 MVA_2b3	0	0	pcs	HTPO10203	21.90					27.50	20.00
				Total ETB	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				Total 50Hertz	0.00	0.00	0.00	0.00	0.00	0.00	0.00

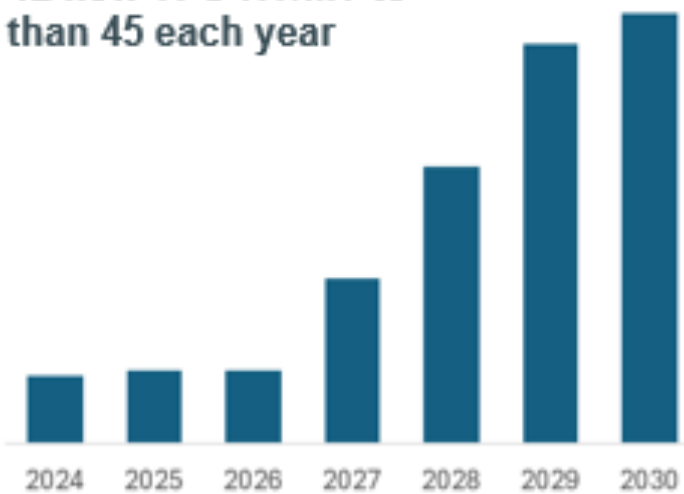
- Lot of data available via raw material passports used for the Upstream platform to calculate the CO2 emissions.
- Main dependency on copper, steel, aluminum and oil.
- Data robustness and proving documents (LCA, EPD, supplier declaration,...) to improve.

Insufficient self-sufficiency for cables and potential for TFO's

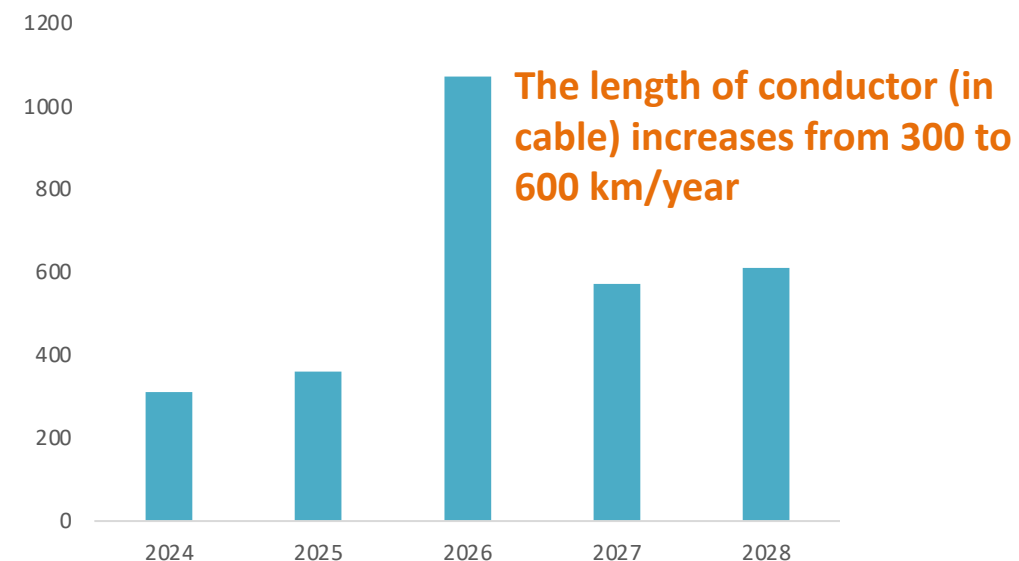
From 12 TFO HT/MT to more than 45 each year*



From 12 new TFO HT/MT to more than 45 each year



The length of conductor (in cable) increases from 300 to 600 km/year*



*The amount of TFOs decommissioned is around 10% of the amount of new TFOs to install**

Year	In/Out	Copper (t)	Self-Sufficiency Ratio
2025	Outflow	65.50	
	Inflow	478.10	
	Surplus (deficit)	-412.60	13.70%
2026	Outflow	142.35	
	Inflow	751.40	
	Surplus (deficit)	-609.05	18.94%
2027	Outflow	200.98	
	Inflow	2,072.50	
	Surplus (deficit)	-1,871.52	9.70%
2028	Outflow	305.98	
	Inflow	1,298.80	
	Surplus (deficit)	-992.82	23.56%
2029	Outflow	141.01	
	Inflow	2,416.62	
	Surplus (deficit)	-2,275.61	5.83%
2030	Outflow	142.35	
	Inflow	2,416.62	
	Surplus (deficit)	-2,274.27	5.89%
2025-2030	Outflow	998.17	
	Inflow	9,434.04	
	Surplus (deficit)	-8,435.87	10.58%

*The quantity of underground cables decommissioned is insignificant compared to the volume of new cables to install**

Year	In/Out	Copper (t)	Self-Sufficiency Ratio
2025	Outflow	6.052	
	Inflow	719.516	
	Surplus (deficit)	-713.463	0.84%

*estimation for illustration purpose

ActNow program, our compass for a sustainable way of operating the grid

and circularity as a support to reduce the environmental impact of our asset needs



Objective 2: Reduce environmental impact of our asset needs*

Key Result Areas

- Grid design and operation
- Grid maintenance
- Supply chain

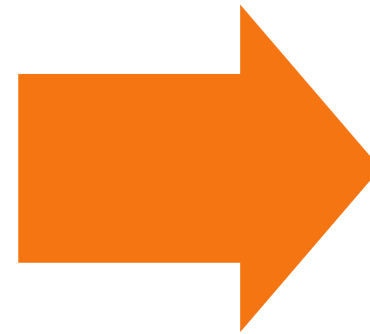
- Continue optimizing the grid (design, construction and operation) by applying key principles in decision making
- Continue extending lifetime of assets by applying key principles in asset maintenance
- Reduce the environmental impact of our supply chain by starting with focusing on copper and steel, by
 - Incentivizing the use of recycled raw material in new assets
 - recycled steel by 2030
 - recycled copper by 2030
 - Maintaining our 2025 final waste production (disposed waste) proportion up to 2030

Ways to reach objectives A and B

Continue optimizing the grid and extending lifetime of assets

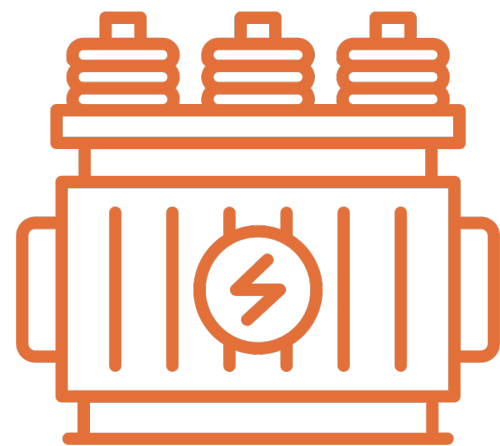


Continue optimizing the grid (design, construction and operation) by applying key principles in decision making

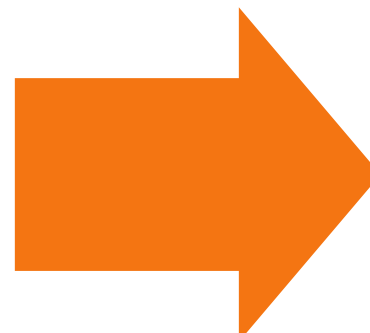


Principles for grid development:

- Plan and design our grid to minimize the need for new assets
- Continuous reevaluation of our investment decisions if fundamental parameters change
- Optimize our planning processes and tools to find the most efficient path for the development of the power grid



Continue extending lifetime of assets by applying key principles in asset maintenance



Principles for asset management:

- Preventive maintenance and monitoring
- Longer lifetime expectancies than our OEM suppliers guarantee
- Relevant spare parts of assets stored
- Reuse unless chapter in the asset fleet strategies

Ways to reach objectives C

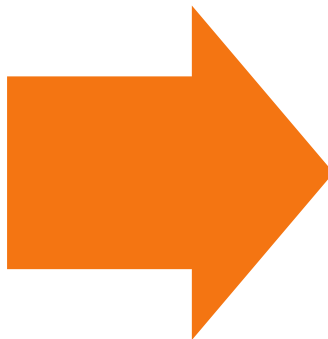
Reduce the environmental impact of our value chain

26	Fe
Iron	
55.847	

*Start with **steel***

29	Cu
Copper	
63.54	

*Next, continue with **copper***

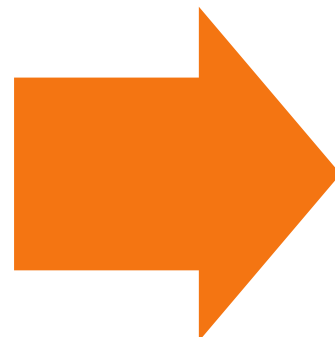


3-step approach:

- Reporting of recycled material inflow, regulations and certification
- Add recycled content criteria in specific tenders
- Explore partnerships to:
 - Develop products with recycled materials
 - Close the loop to ensure suppliers can retrieve old assets



*Start with **waste management**
(medium effort,
medium impact)*



Improve data quality:

- Optimise, digitalise and automate data collection process
- Create extra categories for important categories like metal

Main barriers and opportunities

Main barriers

- **Documentation** : LCA or EPD of sub-contractors not always available
- Low risk appetite as the model is still theoretical, **need for empirical data** on logistics, traceability and costs
- **Great coordination** required by a **central player** and a digital tool like a platform to communicate transparently and trace the raw material and carbon footprint
- Lack of **financial incentives or regulatory** support to encourage these new business models
- Innovation conflicting with regulator's **affordability** focus
- **Reuse of TFO** : does not respect the current noise level requirements
- Conflicting regulations : environmental requirements versus local recycling

Main opportunities

- Optimise the existing potential within our **urban mines**
- **Mitigate our supply chain risk while decreasing our carbon footprint**
- Try to **rebalance the commercial relationship** with the OEM suppliers, as it is presently a supplier-based market with strong imbalance
- Create **common industry standards** with all TSO's
- **Anticipate** the EU regulation
- **Medium term vision**, it is an investment, can bring a competitive advantage

Key messages

- **Ecosystemic approach** and innovation and experimentation at company level
- **Transition takes** time, inspiration, success stories and a reliable framework
- **Realistic circular objectives** in line with market reality and potential
- Provide feedback and advocate for reducing barriers, engage regulators and lawmakers, help **establish our industry standards** and necessary frameworks and think cross-industry to generate new circular business models and tackle the common barriers and opportunities.
- **Digitalise and standardize** when possible (e.g. use the Upstream Platform and standard LCA data)

Thank you very much for your attention.

Any questions?