

Industry

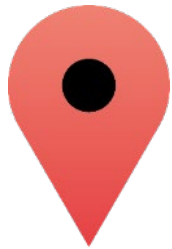
NAVIGATOR

SUSTAINABLE DEVELOPMENT
STRATEGIES FOR T&D

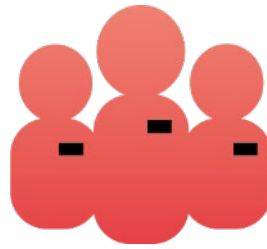
CONFERENCE 2025

EcoPlus2030 Transformers Data Center Application

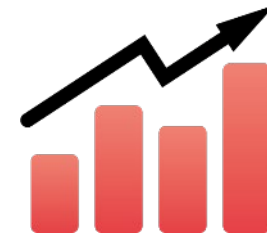
Tesar part of R&S Group



Headquarters in
Sissach, Switzerland



Global workforce with
1000+ employees



CHF 400 million in sales with
strong growth

120+ distribution
partners worldwide



Export in 75+ countries



The Company at a glance

- Tesar was founded in 1979
- Headquarters are in Arezzo, IT
- Member of the R&S Group since 2016
- Two state-of-the-art manufacturing plants including a test laboratory
- Further manufacturing sites and sales offices worldwide



Tesar Factories

Chiaveretto

- Total surface: 40.000 sqm
- Covered surface: 19.000 sqm



Castelnuovo

- Total surface: 19.200 sqm
- Covered surface: 9.620 sqm





Poland – Tesar Polska

In February 2013, a production plant for cast resin transformers was finalized.

Tesar Polska was thus founded.



Argentina – TadeoTesar

In 2000, Tesar established a joint venture with Tadeo in Argentina to supply transformers to South America.



Dubai, UAE – Tesar Gulf

Sales and Rep. Office

With this office the local presence in the Gulf countries has been improved.



Al Ain (UAE) – Tesar Gulf

In September 2012, Tesar started a new production site in Al Ain to supply GCC market.



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Products

Up to 52 kV and 25 MVA for different applications

- Energy distribution
- Industrial applications
- Buildings
- Metro and railway applications
- Renewables: solar, wind, hydro, etc.
- Data Centers
- BESS: Battery Electrical Storage System

Designed according to latest standards

- Eco regulation EU548/2014 – EU2019/1783
- IEC 60076-11

Aimed to minimize environmental contamination and fire hazard

- Tested according E4– C3 – F1

Maximum operating temperature 55°C and transport and storage down to – 50°C



Well over 100,000 installations worldwide



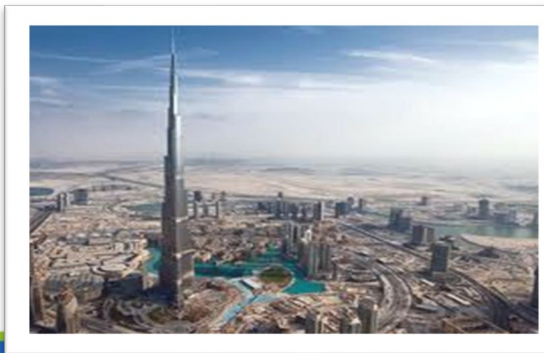
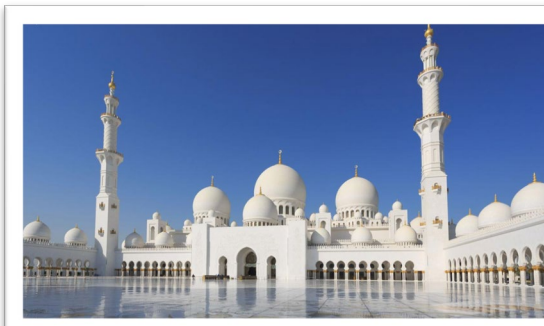
Power plants & renewables



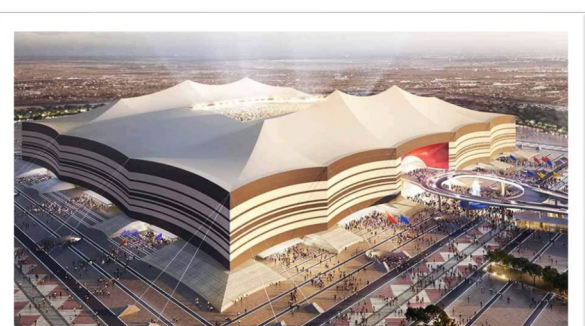
Airports and Railways



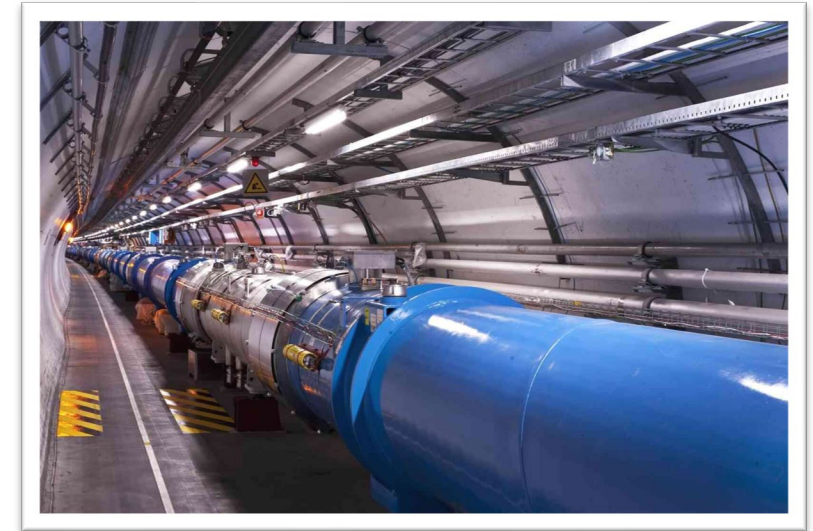
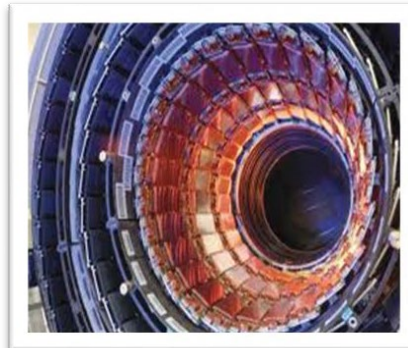
Buildings & Skyscrapers



Sports



Reference projects and applications



- CERN, European Organization for Nuclear Research, Switzerland
- One of the first deliveries of special transformers for a Data Center application inside CERN for research purpose

Climate crisis – Are there any solutions?

“Sustainable development is development that meets the needs of current generations without compromising the needs of future generations.”

[BRUNDTLAND REPORT - “OUR COMMON FUTURE” 1987]



Sustainable Development Goals

The Sustainable Development Goals, SDGs are a series of 17 interconnected goals, defined by the United Nations Organization as a strategy "to achieve a better and more sustainable future for all".



The new Agenda goes beyond the idea that sustainability is solely an environmental issue in favor of an integrated vision of development, and is aimed at all countries without distinction between more and less developed



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EcoPlus2030 Transformer Data Center Application

EcoPlus2030 – Data Center Application

In 2024, the energy consumption of Data Center accounted for approx. 3 % of electricity demand i.e. an HDC (Hyperscale Data Center) needs 20 – 50 MW per year which is the equivalent of the energy needed to supply 35,000 houses



In 2030, the energy consumption of Data Center is expected to be the 20% of electricity demand, therefore usage of highly efficient equipment with lower CO2 emission is necessary to preserve the environment

Regulation to direct the operators to new projects and developments of efficiency in Data Centers for the purpose of sustainability, i.e. EU Directive 7842/24 del 15.03.2024 effectiveness in the use of water, energy reuse factor, or use of renewables, the reuse of waste heat in nearby facilities and networks.

**Source "Ministry of Environment and Energy Security – Italy"*

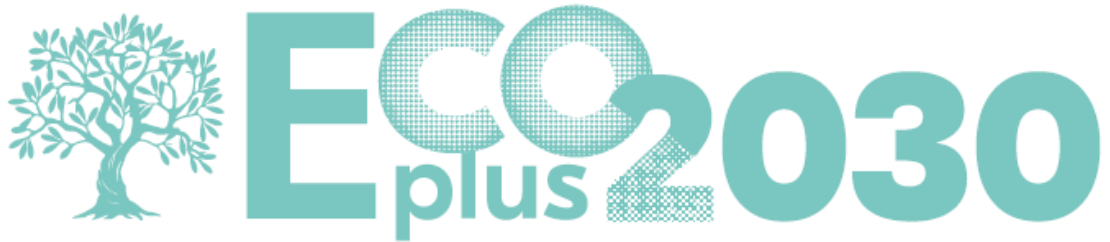
EcoPlus2030 – Data Center Application

The new series of transformers with the lowest CO2 emission ever manufactured

Why **EcoPlus2030** is crucial
to be used in Data Center
Applications?



EcoPlus2030 New Series of Transformers



“...the transformer that reduces the environmental impact without compromising effectiveness and efficiency...”

Why EcoPlus2030?

- The new designed transformer significantly reduce the quantity of CO2 emission comparing to existing European Tier2 regulation for Eco Design
- It follow the new European directives to meet 2030 targets



Reference transformers 1600kVA EcoDesign Tier 2

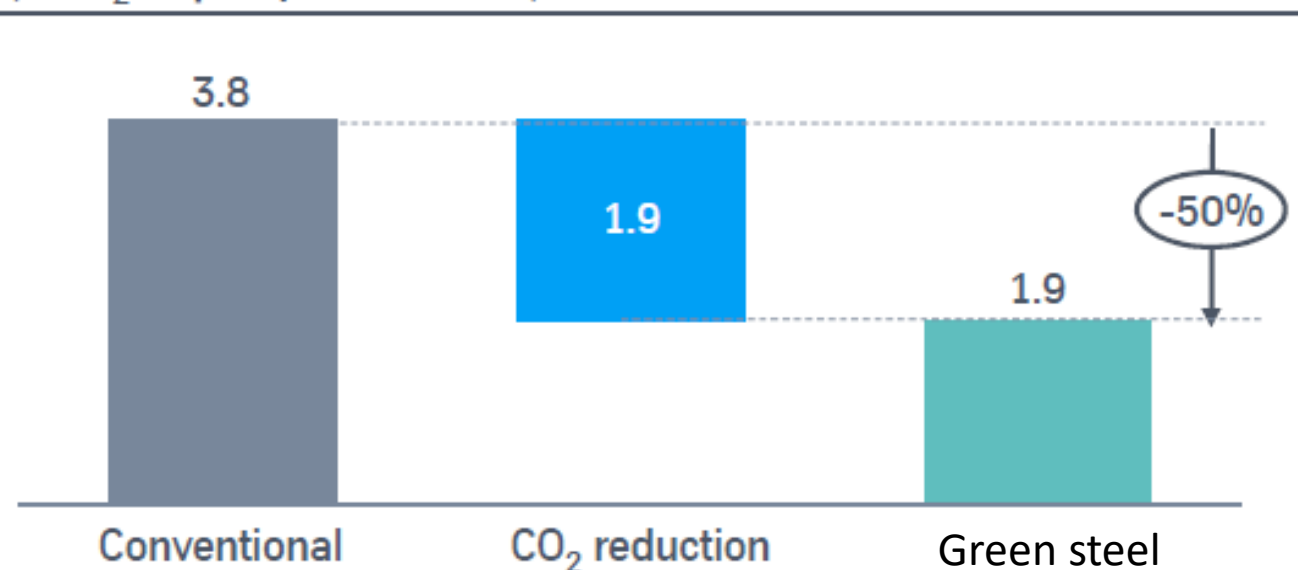
Description	UM	Value
Nominal Power	kVA	1.600
High Voltage	V	20.000
Tap Changer	-	2 x 2,5%
Low Voltage	V	400
Vector Group		Dyn11
No Load Losses (*)	W	1.980
Load losses @ 120°C (*)	W	13.000
Vcc @ 120°C	%	6

* Guaranteed Losses according to European Law EU 548/2014 TIER 2 (max value)



Usage of green steel

CO₂ intensity in grain oriented electrical steel
(t CO₂-equ/t)



CO₂ Reduction thanks to Green steel material usage

Nominal Power (*)	Green steel	CO ₂ Reduction thanks to GOES material
		kg CO ₂
1600 kVA	GS	-5.795

(*) same transformer geometry, magnetic core included



CO₂ Reduction thanks to No Load Losses

Comparison of CO₂ reduction EcoDesign Tier2 vs EcoPlus2030

Nominal Power	No Load Losses (Po)	Energy used (1 year) (**)	Energy used (20 years) (**)	CO ₂ Reduction (1 year) (***)	CO ₂ Reduction (20 years) (***)
	W	kWh	kWh	kgCO ₂	kgCO ₂
1600kVA Tier2	1.980	17.345	346.896	/	/
EcoPlus 2030	1.720	15.067	301.344	- 1.041	- 20.817

(**) it is considered the saving of the energy on No Load Losses

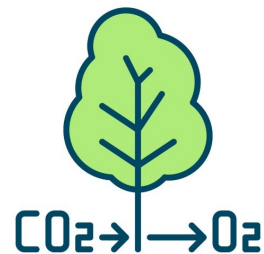
(***) Valid on for Italy, Sorce «AIB 2022 Residual Mix Results»



Total CO₂ Reduction (20 years)

Nominal Power	CO ₂ Reduction thanks to GOES material	CO ₂ Reduction thanks to No Load Losses (20 years)	Total CO ₂ Reduction (20 years)
	kg CO ₂	kg CO ₂	kg CO ₂
1600 kVA	- 5.795	- 20.817	- 26.612

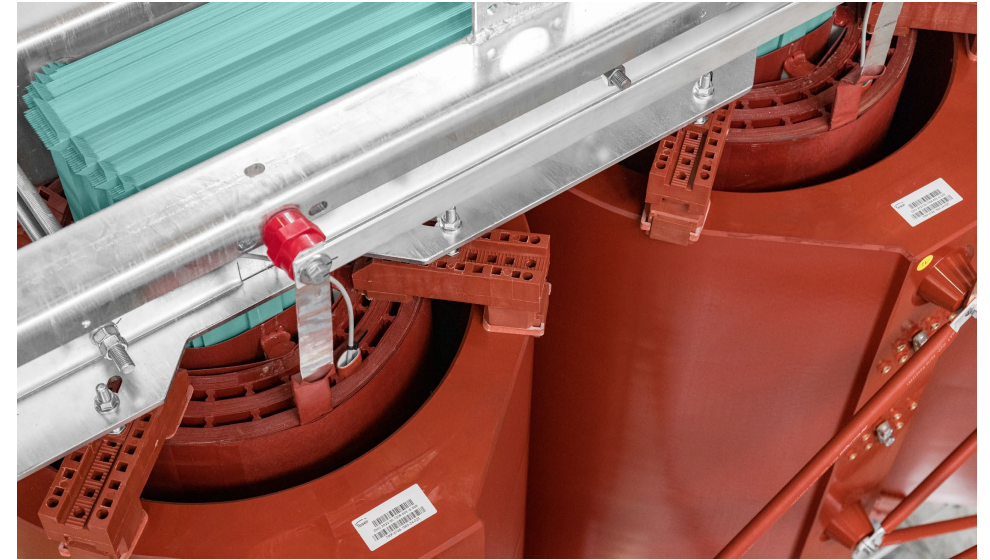
26 ton of CO₂ = 1.000 trees



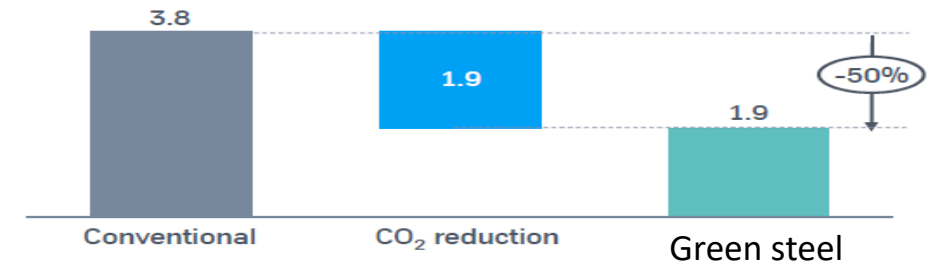
Decarbonization approach – EcoPlus2030

EcoPlus2030 vs EcoDesignTier2

EcoPlus2030	Po	Ipotesi di energia consumata Po in 1 anno	Ipotesi di energia consumata Po in 20 anni	Riduzione CO2			Peso della riduzione di CO2		
	Garanfite			Riduzioni emissioni CO2 per produzione GOES	Riduzioni emissioni CO2 per riduzione Po	Totale riduzione CO2	Dovuto a Po (20 anni)	Dovuto a GOES	
Isolamento 12kV; 17,5kV; 24kV	W	kWh/year	kWh/20y	kg CO2	kgCO ₂ /year	kgCO ₂ 20 years	kgCO ₂ 20 years	%	%
EcoDesign Fase 2 - 160kVA	360	3.154	63.072						
EcoPlus2030 - 160kVA	360	3.154	63.072	-1064	0	0	-1064	0,0	100,0
EcoDesign Fase 2 - 250kVA	468	4.100	81.994						
EcoPlus2030 - 250kVA	435	3.811	76.212	-1520	-132	-2642	-4162	63,5	36,5
EcoDesign Fase 2 - 400kVA	675	5.913	118.260						
EcoPlus2030 - 400kVA	585	5.125	102.492	-1948	-360	-7206	-9153	78,7	21,3
EcoDesign Fase 2 - 500kVA	812	7.113	142.262						
EcoPlus2030 - 500kVA	730	6.395	127.896	-1995	-328	-6565	-8560	76,7	23,3
EcoDesign Fase 2 - 630kVA	990	8.672	173.448						
EcoPlus2030 - 630kVA	835	7.315	146.292	-2755	-621	-12410	-15165	81,8	18,2
EcoDesign Fase 2 - 800kVA	1.170	10.249	204.984						
EcoPlus2030 - 800kVA	1.040	9.110	182.208	-2850	-520	-10409	-13259	78,5	21,5
EcoDesign Fase 2 - 1000kVA	1.395	12.220	244.404						
EcoPlus2030 - 1000kVA	1.190	10.424	208.488	-3610	-821	-16414	-20024	82,0	18,0
EcoDesign Fase 2 - 1250kVA	1.620	14.191	283.824						
EcoPlus2030 - 1250kVA	1.440	12.614	252.288	-4275	-721	-14412	-18687	77,1	22,9
EcoDesign Fase 2 - 1600kVA	1.980	17.345	346.896						
EcoPlus2030 - 1600kVA	1.720	15.067	301.344	-5795	-1041	-20817	-26612	78,2	21,8
EcoDesign Fase 2 - 2000kVA	2.340	20.498	409.968						
EcoPlus2030 - 2000kVA	2.055	18.002	360.036	-6460	-1141	-22819	-29279	77,9	22,1
EcoDesign Fase 2 - 2500kVA	2.790	24.440	488.808						
EcoPlus2030 - 2500kVA	2.525	22.119	442.380	-7695	-1061	-21218	-28913	73,4	26,6



CO2 intensity in grain oriented electrical steel (t CO₂-equ/t)



EcoPlus2030 – Circular Economy

As regards the production cycle of transformers, it should be considered that almost all the production waste of the materials used are recycled, such as metals (Al and Cu, iron, plastic, paper, wood, etc.).

CAST RESIN TRANSFORMER RECYCLE

The percentage of recyclable material on each of their main transformer components:

- Magnetic Core
- HV Windings
- LV Windings
- Enclosure



95% Iron → Recyclable

5% Other material e.g. Straps, painted lamination, zinc → Disposal



50% Aluminum → Recyclable

50% Resin/insulating → Disposal (according to Italian law)



85% Aluminum → Recyclable

15% Insulating → Disposal



95% Iron → Recyclable

5% Insulating/other component → Disposal



Circular economy activities

1. Extension and improvement of the product life cycle:

- Repair
- Maintenance
- Reconditioning
- Regeneration

2. Production cycle and management of the end of life of the product

- Recycling

TESAR has the possibility to stipulate contracts to extend and/or improve the life cycle of the product, carrying out service activities such as repair, maintenance and/or reconditioning of transformers already installed or directly promoting the replacement of the old transformer with a new one with lower losses/lower CO₂ emissions and energy/money savings. We can also provide the collection service of the old transformer and take care of its recycling.





A company of **R&S**

Q&A

We guarantee energy

