



DISTRIBUTE POWER; NOT CO₂

MODULAR
ELSTEEL
ENCLOSURES

CO₂

26% CO₂ reduction?
It's possible today!



Elsteel is committed to the environment. Through research, development, testing and passion we're building greener panels and a greener future. Our goal is to manufacture 100% sustainable panels.

Fang Logstrup
Managing Director

We all want cost effective solutions. And to do that most people design panels using the smallest possible breakers, busbars, cables etc. That creates enormous watt loss and this is where we can make a change!

Designing a panel in accordance with IEC 61439 is not enough since the standard allows temperature rises up to 105 - 120 centigrade.

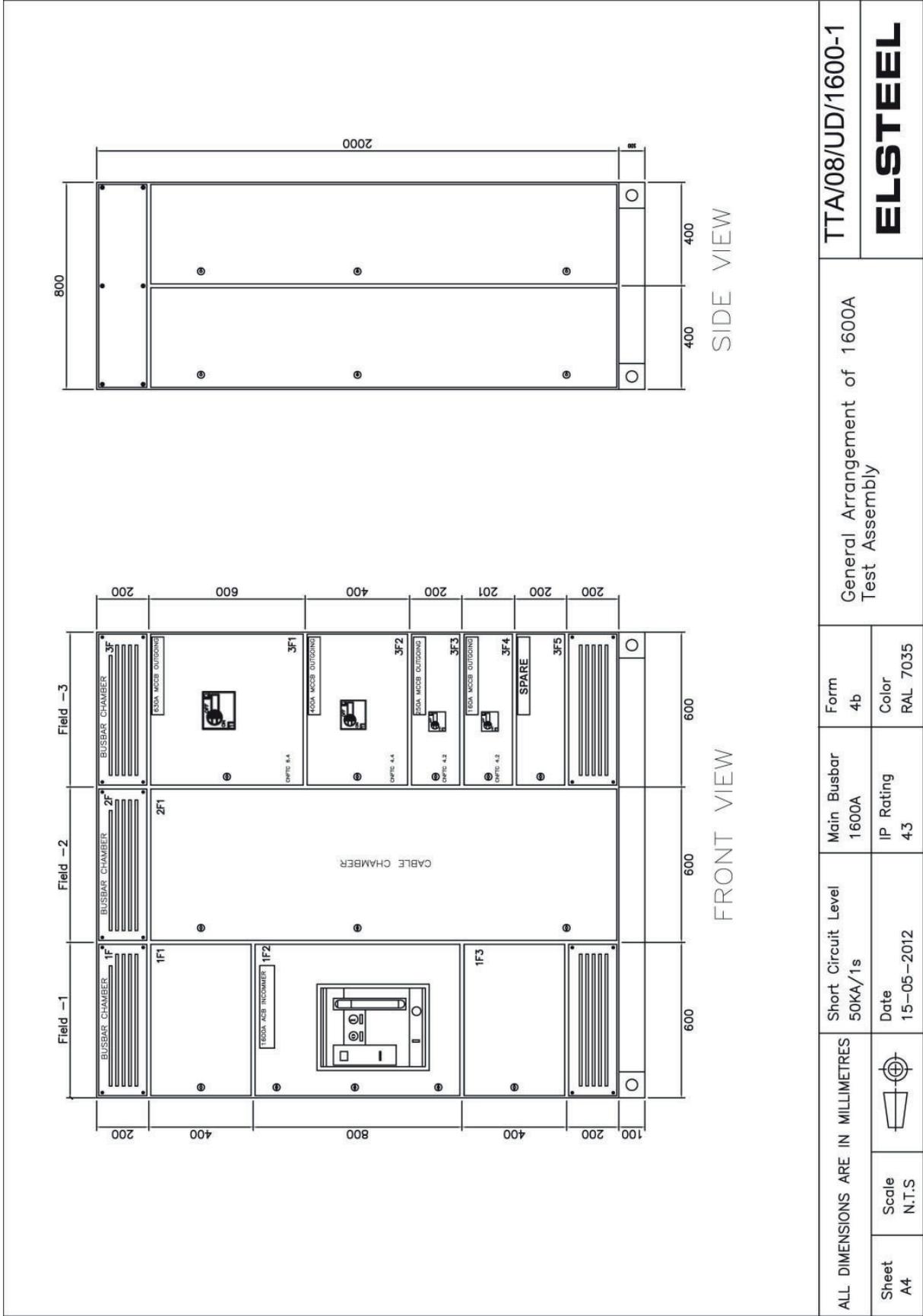
In order to reduce carbon emissions & global warming, we as engineers must offer “green panels”, rather than “cheap” panels!

The initial investment for a green panel will be higher but the extra cost can be recouped in just one year and you will actually save money as well as help the planet in the long run.

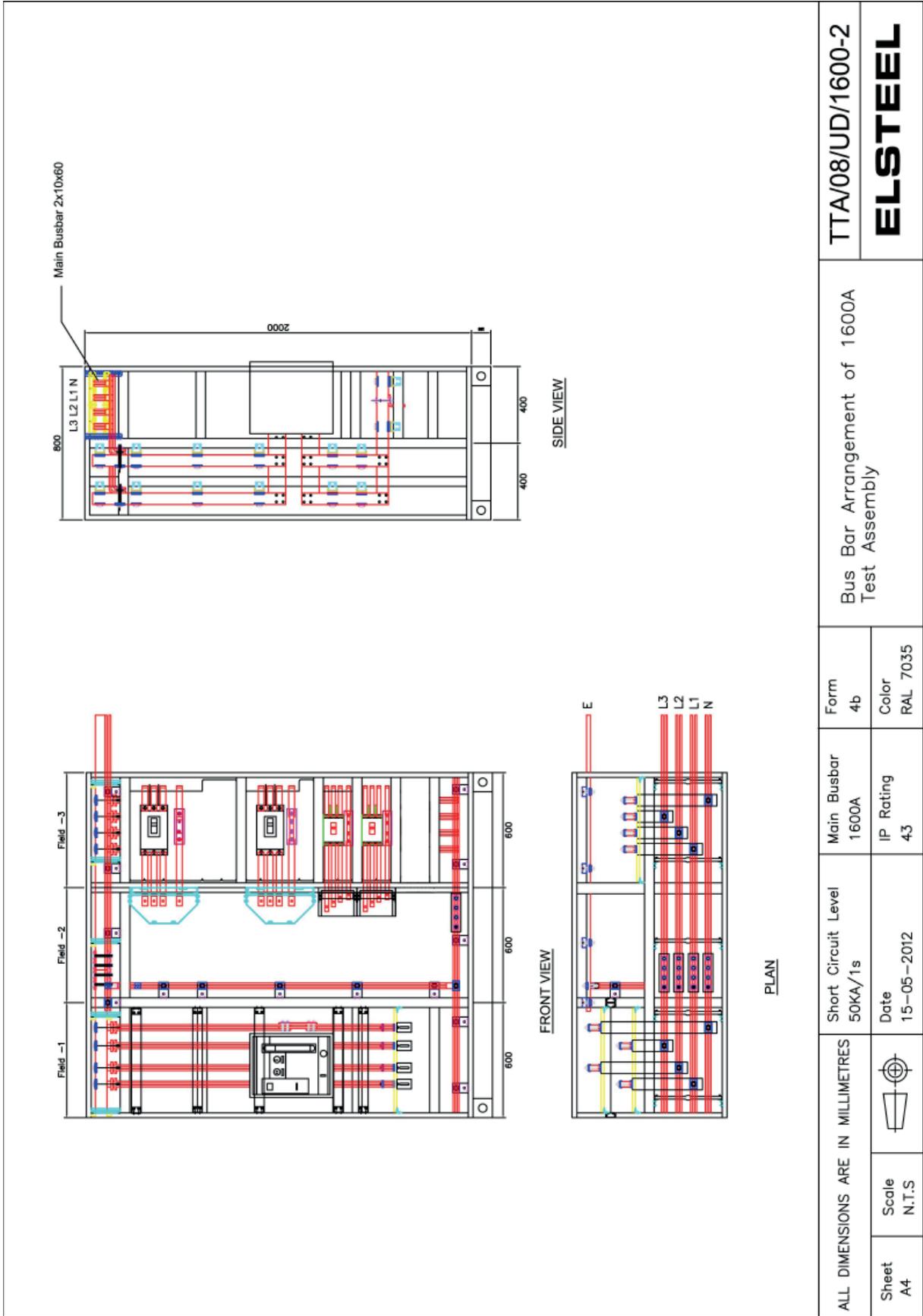
You just need to follow these 4 simple steps to go eco on your panel.



TEST PANEL



ALL DIMENSIONS ARE IN MILLIMETRES		Short Circuit Level 50KA/1s	Main Busbar 1600A	Form 4b	General Arrangement of 1600A Test Assembly		TTA/08/UD/1600-1
Sheet A4	Scale N.T.S	Date 15-05-2012	IP Rating 43	Color RAL 7035	ELSTEEL		



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											ELSTEEL

GREEN PANEL CALCULATION SHEET

Standard panel configuration

Current rating	1600.00 A
Main busbar and dropper busbar size	2x10x60 mm
Main busbar and dropper busbar length	7.30 m
Watt loss of the busbar system (according to table-1)	909.22 W
Watt loss of standard breakers fitted in the panel (according to table-2)	673.75 W
Total watt loss due to heating (busbars and breakers)	1582.97 W
Energy loss per year (at full load 24 hours per day)	13866.77 kWh
CO2 emission when generating above energy per year	13034.77 kg

One step up Cu busbar size and breaker rating

Current rating	1600 A
The next available higher size of main and dropper busbar	2x10x80 mm
Watt loss of the busbar system (according to table-1)	691.31 W
Watt loss of breakers of next available higher size frames (according to table-2)	475.36 W
Total watt loss due to heating (busbars and breakers)	1166.67 W
Energy loss per year (at full load 24 hours per day)	10220.03 kWh
CO2 emission when generating above energy per year	9606.83 kg

Savings due to one step up busbar system and breakers rating

Power saving	416.30 W
Energy saving per year	3646.74 kWh
Cost of 1kWh energy	0.33 EUR
Saving in Euro per year	1203.43 EUR
CO2 saving per year	3427.94 kg
CO2 saving percentage	26.3 %

Additional investment cost due to one step up busbar system and breakers

Additional Cu weight needed to step up the busbar system (according to table-1)	78.11 kg
Cu cost per 1 Tonne	6.31 EUR
Additional investment cost for Cu	492.87 EUR
Additional investment cost for one step higher breakers	1003.78 EUR
Total investment cost to one step up	1496.65 EUR

Payback period of investment **15 Months**

Above shall be treated as guidance only as this is an example.

CALCULATION TABLE FOR Cu BUSBARS

Rated Current (A)	Standard 3P busbar system		One step-up busbar system			Saving for 3P busbar system		
	Busbar size (mm)	Watt loss (W/200mm)	Busbar size (mm)	Watt loss (W/200mm)	Additional Cu weight (kg/200mm)	Power saving (W/200mm)	Energy saving per year (kWh/200mm)	CO ₂ saving per year (kg/200mm)
250	2-10×5	6.53	2-10×10	3.16	0.53	3.37	29.52	27.75
400	2-10×10	8.30	2-10×15	5.43	0.53	2.87	25.14	23.63
630	2-10×15	13.86	2-10×20	10.41	0.53	3.45	30.22	28.41
800	2-10×20	17.2	2-10×30	11.34	1.07	5.86	51.33	48.25
1000	2-10×30	18.16	2-10×40	13.44	1.07	4.72	41.35	38.87
1250	2-10×40	21.45	2-10×50	17.62	1.07	3.83	33.55	31.54
1600	2-10×60	24.91	2-10×80	18.94	2.14	5.97	52.30	49.16
2000	2-10×80	30.42	2-10×100	24.6	2.14	5.82	50.98	47.92
2500	2-10×100	39.64	3-10×80	28.84	2.14	10.80	94.61	88.93
3200	3-10×100	39.55	4-10×80	34.14	1.07	5.41	47.39	44.55
4000	4-10×100	44.34	6-10×80	36.53	4.28	7.81	68.42	64.31
5000	6-10×80	58.88	6-10×100	47.46	6.42	11.22	98.29	92.39
6300	6-10×100	77.69	8-10×80	71.02	2.14	6.67	58.43	54.92

Note : Emission Factor = 0.94kg of CO₂ / kWh (source - International Energy Agency)

Table - 1

BREAKERS USED IN THE PANEL

	Standard breaker size		One step up frame size of breakers		Additional cost to one step up breaker (EUR)
	Breaker type	Watt loss (W)	Breaker type	Watt loss (W)	
160	FE160 (Fixed version)	48.00	FE250 (Fixed version)	40.70	28.83
250	FE250 (Fixed version)	61.88	FG400 (Fixed version)	20.63	124.69
400	FG400 (Fixed version)	52.80	FG630 (Fixed version)	52.80	50.66
630	FG630 (Fixed version)	119.07	FK800 (Fixed version)	47.63	489.42
1600	MPACT PLUS ACB-1600A	392.00	PACT PLUS ACB-2000A	313.60	310.18
	Total	673.75		475.36	1003.78

Table - 2

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Technology

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