Procedimento di Valutazione Impatto Ambientale ex art. 23 D.Lgs. 152/2006
e Autorizzazione Unica ex art. 12 D.Lgs. 387/2003

Progetto Parco Solare Fotovoltaico Calapricello Comune di Taranto (TA)

Calcoli Preliminari degli impianti del progetto definitivo

Load Flow DC

REDATTO DA / WRITTEN BY

Maurizio Vanti

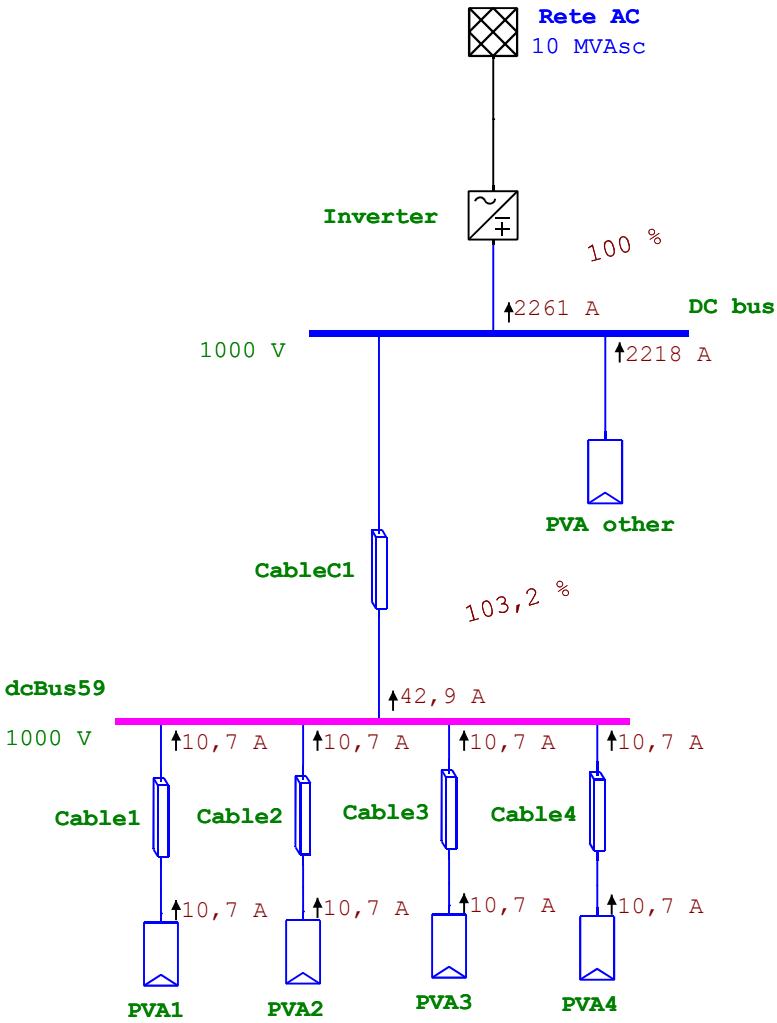
APPROVATO DA / APPROVED BY

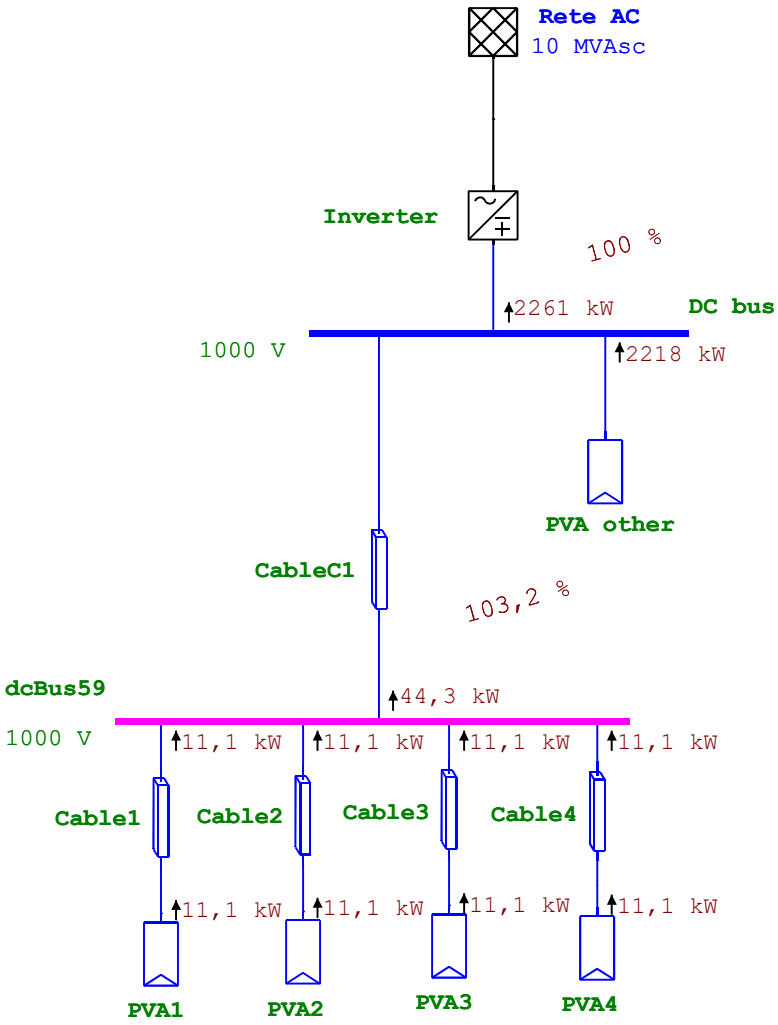
Marco Giannettoni

REVISIONE	N°	DATA/DATE
Prima Emissione	00	Luglio 2022

MARCO GIANNETTONI
21.07.2022
11:11:24
GMT+01:00

TASSARA MARCO
21.07.2022
11:18:01
GMT+01:00


Rete AC
10 MVAsc
Inverter
100 %
2261 A
DC bus
1000 V
2218 A
PVA other
CableC1
103,2 %
dcBus59
42,9 A
1000 V
10,7 A
10,7 A
10,7 A
10,7 A
Cable1
Cable2
Cable3
Cable4
10,7 A
10,7 A
10,7 A
10,7 A
PVA1
PVA2
PVA3
PVA4


Rete AC
10 MVAsc
Inverter
100 %
2261 kW
DC bus
1000 V
2218 kW
PVA other
CableC1
103,2 %
dcBus59
44,3 kW
1000 V
11,1 kW
11,1 kW
11,1 kW
11,1 kW
Cable1
Cable2
Cable3
Cable4
11,1 kW
11,1 kW
11,1 kW
11,1 kW
PVA1
PVA2
PVA3
PVA4

Electrical Transient Analyzer Program

DC Load Flow Analysis

Load Category: Design

Inverter Load: Operating Load Used

Load Diversity Factor: Normal Loading

	Voltage Reg.	Load	Total
Number of Buses:	1	5	6

	Charger	UPS	Inverter	DC Converter	Total
Number of Converters:	0	0	1	0	1

	Cable	Impedance	Tie PD	Total
Number of Branches:	5	0	0	5

	Battery	PV Array
Number of Sources:	0	5

	Motor	Static Load	Lumped Load	Composite CSD	Total
Number of Loads:	0	0	0	0	0

Method of Solution:	Newton-Raphson Method
Max. No. of Iterations:	99
Precision of Solution:	0.0001000
Unit System:	Metric
Project File:	Calapricello_20201218_DC
Output File:	C:\Users\Maurizio\Desktop\Modelli ETAP\Calapricello\Calapricello_rev001\Untitled.DL1S

Bus Input Data

Bus			Initial V	Nominal Load (kW)		
ID	Type	Volt	% Mag.	Constant kVA	Constant Z	Constant I
DC bus	Voltage Reg.	1000.00	100.0			-2584.280
dcBus55	Load	858.20	100.0			-11.089
dcBus56	Load	858.20	100.0			-11.089
dcBus57	Load	858.20	100.0			-11.089
dcBus58	Load	858.20	100.0			-11.089
dcBus59	Load	1000.00	100.0			

Cable Input Data

Cable	Connected Buses		ohms or micro H / 1000 m per Conductor				
ID	From	To	Length(m)	#/Phase	T (°C)	R	L
Cable1	dcBus59	dcBus55	5.0	1	75	7.55560	315.13
Cable2	dcBus59	dcBus56	5.0	1	75	7.55560	315.13
Cable3	dcBus59	dcBus57	5.0	1	75	7.55560	315.13
Cable4	dcBus59	dcBus58	5.0	1	75	7.55560	315.13
CableC1	DC bus	dcBus59	100.0	1	75	3.14050	283.30

Cable resistance listed at the specified temperature

Branch / Converter / UPS Connections

CKT/Branch		Connected Bus ID		Impedance	
ID	Type	From Bus	To Bus	(ohm)	(%) 100 MVAb
Cable1	Cable	dcBus59	dcBus55	0.09011	1223.53
Cable2	Cable	dcBus59	dcBus56	0.09011	1223.53
Cable3	Cable	dcBus59	dcBus57	0.09011	1223.53
Cable4	Cable	dcBus59	dcBus58	0.09011	1223.53
CableC1	Cable	DC bus	dcBus59	0.74912	10171.27
Inverter	Inverter	DC bus	Secondario trasformatore		

Inverter Input Data

Inverter ID	Rating Parameters					Operating Parameters						
	AC		DC					MPPT				
	Rated kVA	Rated kV	Power kW	V	FLA	Mode	Load kW	MPPT at	Ini V %	Min V %	Max V %	Step %
Inverter	2500.00	0.55	2551.00	1000.00	2551.00	PV Inverter		PV Array				

PV Array Input Data

PV Array				Panel Parameters					Connection		Adjustment Coefficients		
ID	Power kW	Vmp Volt	Imp Amp	Power Watt	Vmp Volt	Imp Amp	Voc Volt	Isc Amp	Series	Parallel	Alpha Isc % / °C	Beta Voc % / °C	Delta Voc
PVA other	2464.00	858.20	2872.00	440.00	30,65	14,36	37,80	15,79	28	200	0.0360	-0.3320	0.0450
PVA1	12.32	858.20	14.36	440.00	30,65	14,36	37,80	15,79	28	1	0.0360	-0.3320	0.0450
PVA2	12.32	858.20	14.36	440.00	30,65	14,36	37,80	15,79	28	1	0.0360	-0.3320	0.0450
PVA3	12.32	858.20	14.36	440.00	30,65	14,36	37,80	15,79	28	1	0.0360	-0.3320	0.0450
PVA4	12.32	858.20	14.36	440.00	30,65	14,36	37,80	15,79	28	1	0.0360	-0.3320	0.0450

PV Array with Curve Model

PV Array	Curve Model Library			
ID	Manufacturer	Model	Size	Max Vdc

LOAD FLOW REPORT

Bus			Op. V	Source	Load (kW)			Load Flow		
ID	Type	V	%	kW	Const. kVA	Const. Z	Const. I	To Bus ID	kW	Amp
DC bus	Voltage Reg.	1000.0	100.0	2217.829	2260.76	0.00	0.00	dcBus59	-42.934	-42.934
								Inverter	2260.763	2260.763
								PVA other	-2217.829	-2217.829
dcBus55	Load	858.2	120.4	11.089	0.00	0.00	0.00	dcBus59	11.089	10.733
								PVA1	-11.089	-10.733
dcBus56	Load	858.2	120.4	11.089	0.00	0.00	0.00	dcBus59	11.089	10.733
								PVA2	-11.089	-10.733
dcBus57	Load	858.2	120.4	11.089	0.00	0.00	0.00	dcBus59	11.089	10.733
								PVA3	-11.089	-10.733
dcBus58	Load	858.2	120.4	11.089	0.00	0.00	0.00	dcBus59	11.089	10.733
								PVA4	-11.089	-10.733
dcBus59	Load	1000.0	103.2	0	0.00	0.00	0.00	dcBus55	-11.079	-10.733
								dcBus58	-11.079	-10.733
								dcBus57	-11.079	-10.733
								dcBus56	-11.079	-10.733
								DC bus	44.315	42.934

Branch Flow Summary Report

Branch		Connected Bus ID		Branch Flow				% Bus Voltage		
ID	Type	From Bus	To Bus	(kW) From-To	(kW) To-From	(kW) Losses	Amp	From Bus	To Bus	% Vd
Cable1	Cable	dcBus59	dcBus55	-11.079	11.089	0.010	10.733	103.22	120.38	0.10
Cable4	Cable	dcBus59	dcBus58	-11.079	11.089	0.010	10.733	103.22	120.38	0.10
Cable3	Cable	dcBus59	dcBus57	-11.079	11.089	0.010	10.733	103.22	120.38	0.10
Cable2	Cable	dcBus59	dcBus56	-11.079	11.089	0.010	10.733	103.22	120.38	0.10
CableC1	Cable	DC bus	dcBus59	-42.934	44.315	1.381	42.934	100.00	103.22	3.22

OverVoltage Buses Summary Report

Overvoltage Buses - Critical Limit = 105 % - Marginal Limit = 102 %

Bus		Operating V		Bus		Operating V	
ID	V	% Mag	V	ID	V	% Mag	V
* dcBus55	858.20	120.38	1033.13	* dcBus56	858.20	120.38	1033.13
* dcBus57	858.20	120.38	1033.13	* dcBus58	858.20	120.38	1033.13
# dcBus59	1000.00	103.22	1032.16				

* Indicates bus voltages violate critical limit
\# Indicates bus voltages violate marginal limit

UnderVoltage Buses Summary Report

Undervoltage Buses - Critical Limit = 95 % - Marginal Limit = 98 %

Bus		Operating V		Bus		Operating V	
ID	V	% Mag	V	ID	V	% Mag	V

* Indicates bus voltages violate critical limit
\# Indicates bus voltages violate marginal limit

Summary of Total Sources and Demands

Charger/UPS Source:	0.00	kW
Battery Source:	2262.19	kW
Total Source:	2262.19	kW
Total Motor Load:	2260.76	kW
Total Static Load:	0.00	kW
Total Current Load:	0.00	kW
Total Demand:	2260.76	kW
Total Losses:	1.42	kW
System Mismatch:	0.00	
Number of Iterations:	4	