



*Greening Energy
Market and Finance*

Project website: <http://grenfin.eu>

A BIOMETHANE PLANT AND GREEN HYDROGEN

Team 4



With the support of the
Erasmus+ Programme
of the European Union



Question 1

CARBON FOOTPRINT

$$\text{kgCO}_2/\text{kgH}_2 = \text{EF} * \text{HHVH}_2$$

SMR NO CCUS – 11,81 kgCO₂/kgH₂

SMR WITH CCS – 3,15 kgCO₂/kgH₂

ELECTROLISYS – GRID – 31,10 kgCO₂/kgH₂

WIND – 0,98 kgCO₂/kgH₂





Question 1

SANT'AGATA PLANT EF

PRETREATMENT	90 MWh/month		HHV	10,4 kWh/Sm3		
ANAEROBIC	70 MWh/month					
FINAL	10 MWh/month					
PRETREATMENT	300 MWh/month					
AIR	45 MWh/month		ANAEROBIC	19.000 Sm3/month		
TOTAL	515.000 kWh/month		TOTAL	19.000 Sm3/month		
	6.180.000 kWh/year			2.371.200 kWh/year		
	2.984.940 kgCO2/year			478.982 kgCO2/year		
TOTAL YEARLY EMISSIONS	3.463.922	kgCO2/year		0,71475771		
CH4 PRODUCTION	5.625.000	kgCH4/year				
H2 PRODUCTION	12.228.261	kgH2/year		1.5 million		
SANT'AGATA PLAN EF	0,28	KgCO2/KgH2				



Question 2

SMR NO CCS FOR SANT'AGATA PLANT

H2 PRODUCTION		1.500.000	kgH2/year					
HHV H2		0,0254	kgH2/kWh					
YEARLY WORKING HOURS		8.322	h/year					
EQUIVALENT ENERGY PRODUCTION		7.096	kW					
SMR								
CAPEX		6.457.601	USD/year					
OPEX		303.507	USD/year					
ELECTROLSYS								
CAPEX		6.187.943	USD/year					
OPEX		142.067	USD/year					





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