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District Heating Company of Amyndeo – DHCA

Biomass- Amindeo District heating Amindeo

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WESTERN MACEDONIA PPC POWER PLANTS



- Coal Region
- 4.100 MW Power Plants
- 3 District Heating Systems depending on lignite combustion



AMINDEO DISTRICT HEATING

DISTRICT HEATING SYSTEM → PPC Amindeo lignite power plant (steam-electric power station) (2 x 300 - 25 MW)

Amindeo PPC Units → (Provider Company, we purchase heat from PPC, on the basis of contract)

DHCA → (Owner - Operator of Transmission and distribution heating network – sell to the final consumers)

✓ municipal enterprise

✓ District Heating systems in Western Macedonia were depended on PPC power units

AMINDEO DISTRICT HEATING



DISTRICT HEATING TARRIFS

DH Consumer's Tarrif : 56 €/MWh (including VAT 6%)

For Heat oil price $\approx 1,2$ €/lit , the cost to produce 1 MWh > 140 €

The Municipal DH company policy results Space Heating Cost at least 50 % of relevant Oil cost.

Total annual heating energy consumed by users: 45.000 MWh

Energy produced : 60.000 MWh (90% efficiency of distribution – transmission network) → Energy supplied by PPC

Need for transition to a different heating model

- ✓ EU's commitment to reduce CO2 emissions (European 2030 Framework for Climate and Energy)
- ✓ European environmental legislation for reduction of industrial emissions (Directive 2010/75/EU)
- ✓ Peak in the CO2 emissions price amounting from 7.5€/tn in 2014 to 30 €/tn in the next years

→ Decline use of coal

→ PPC Units closing down

Amindeo power station (PPC) is expected to close in the mid of 2020

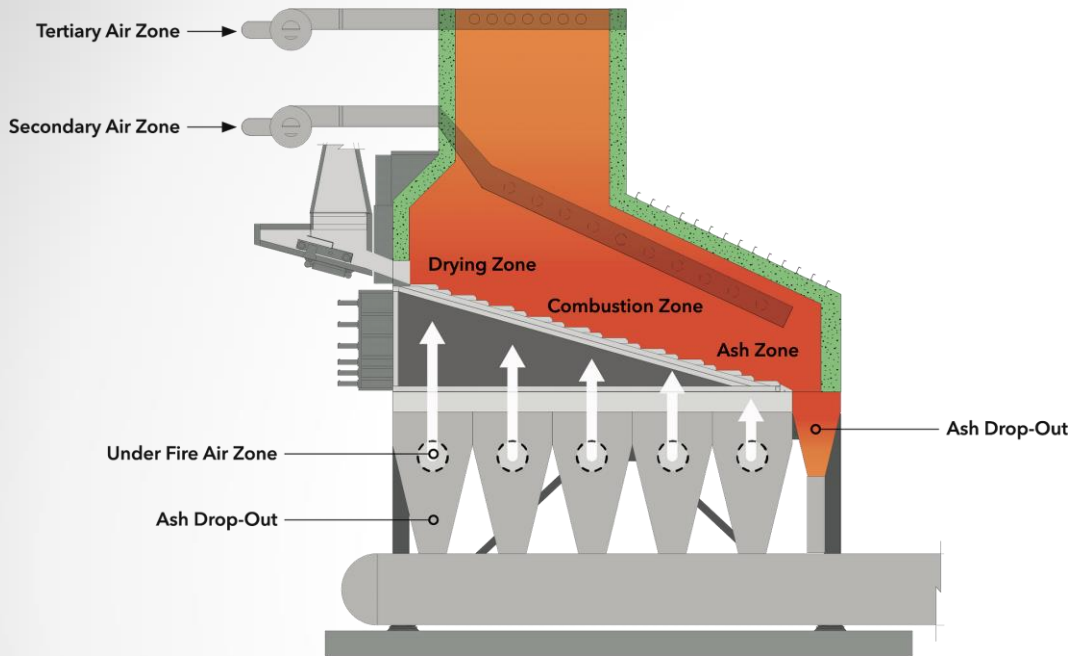
Investigate RES in district heating system

installation of a new thermal energy production unit

biomass combustion plant (2012/27/EU)

serve Amindeo's existing district heating system and future extensions

AMINDEO 30 MW Biomass Thermal Power Plant

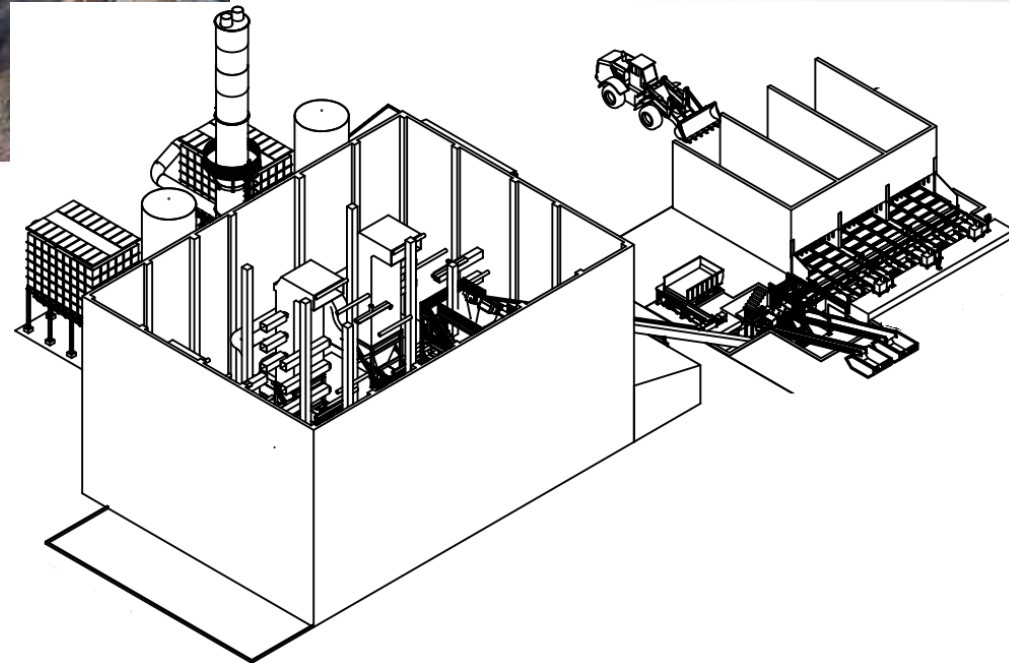


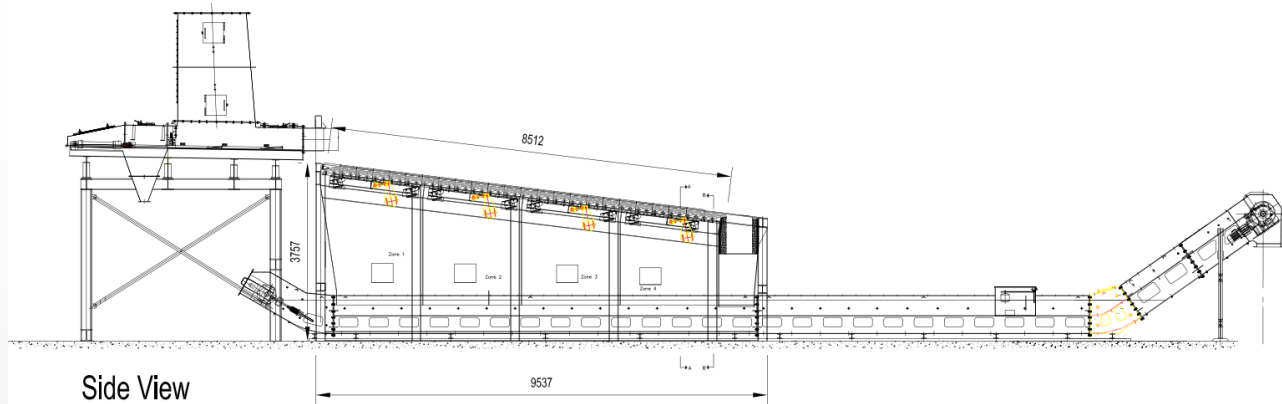
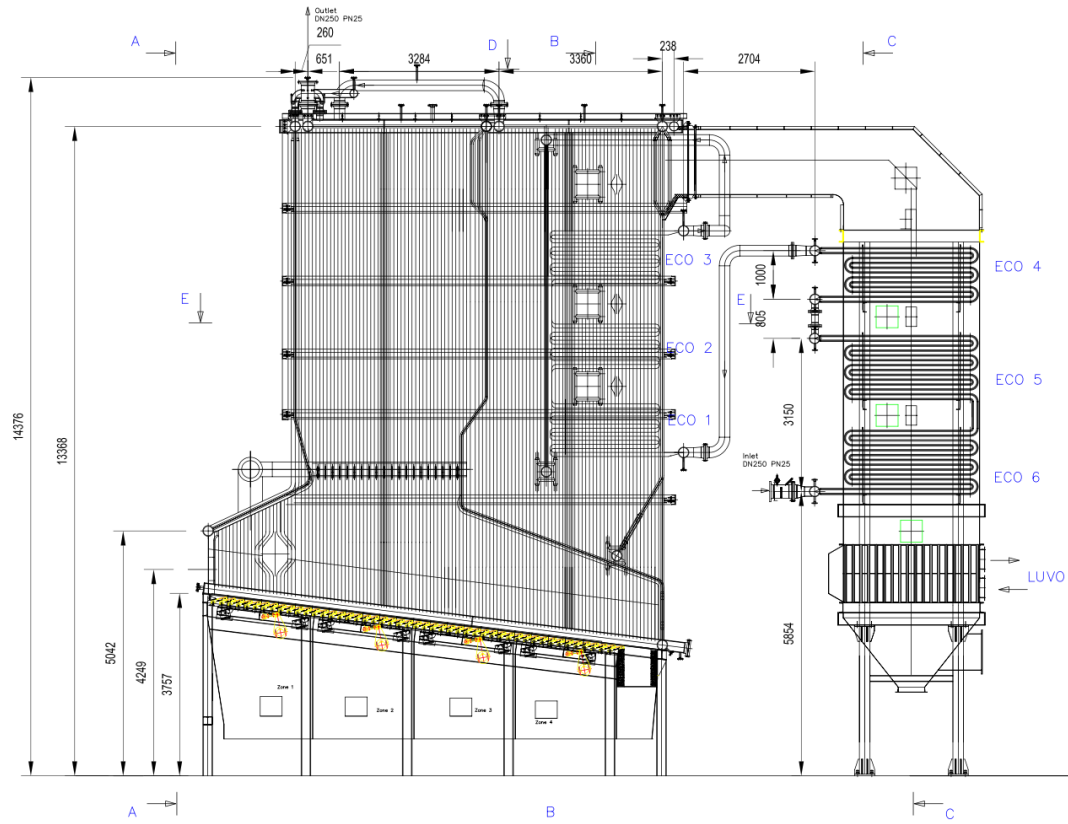
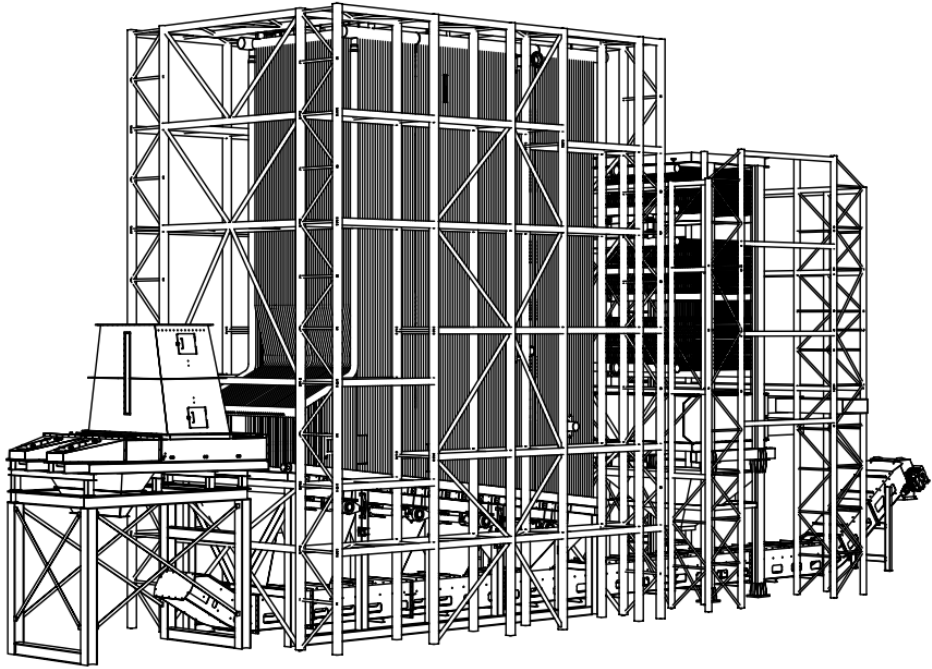
Thermal power	15 MW
Maximum allowable pressure	19 bar
Operating pressure	14 bar
Test pressure	27,17 bar
Water temperature at the inlet to the economizer	70 °C
Outlet water temperature	130 °C
Heating area of the boiler	1303m ²
Combustion grate area	26 m ²
Boiler efficiency	$\eta=0,88$
Pressure drop through the boiler on the water side	1,97 bar
Fuel	mixture (biomass and lignite)
Lower calorific value	Hd=2 Mwh/tn
Fuel consumption	8128 kg/h
Furnace type / volume	Shielded furnace with movable inclined grate, 116.5 kW / m ³

AMINDEO 30 MW Biomass Thermal Power Plant

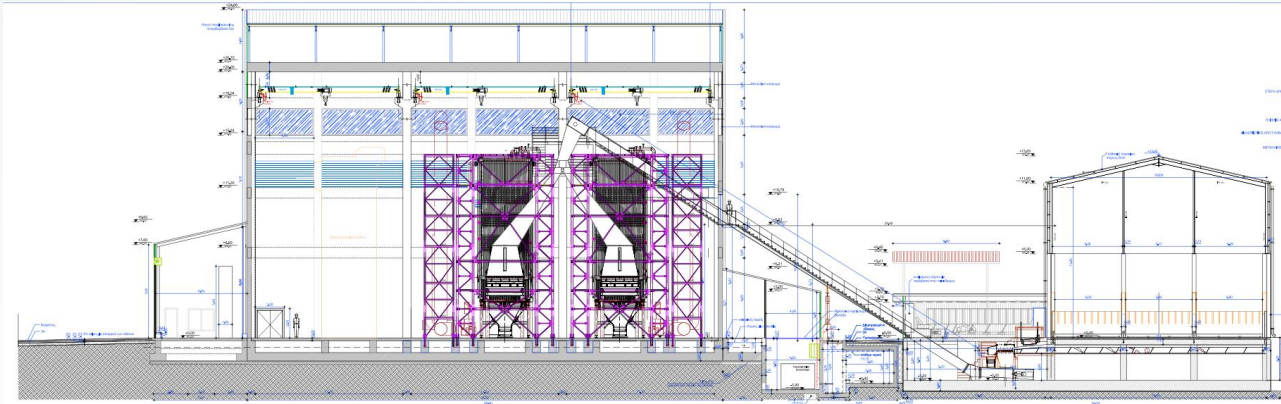
- ✓ Total capacity of 30 MW (2x15 MW) will cover the thermal needs of the existing district heating network of Amindeo as well as future thermal needs.
- ✓ Combustion of biomass with a small amount of lignite. The project fully complies with the Directive 2012/27/EU on Energy Efficiency (L. 4422 / 2015) as an efficient district heating system, since it uses more than 50% renewable energy sources (RES).
- ✓ The project cost was 11.75 m€ without VAT and is financed (55%) by European Cohesion Policy funds through the NSRF (National Strategic Reference Framework) 2014-2020". The rest was covered by Loan from District heating company and municipal funds.
- ✓ Commissioning was October of 2020

AMINDEO 30 MW Biomass Thermal Power Plant

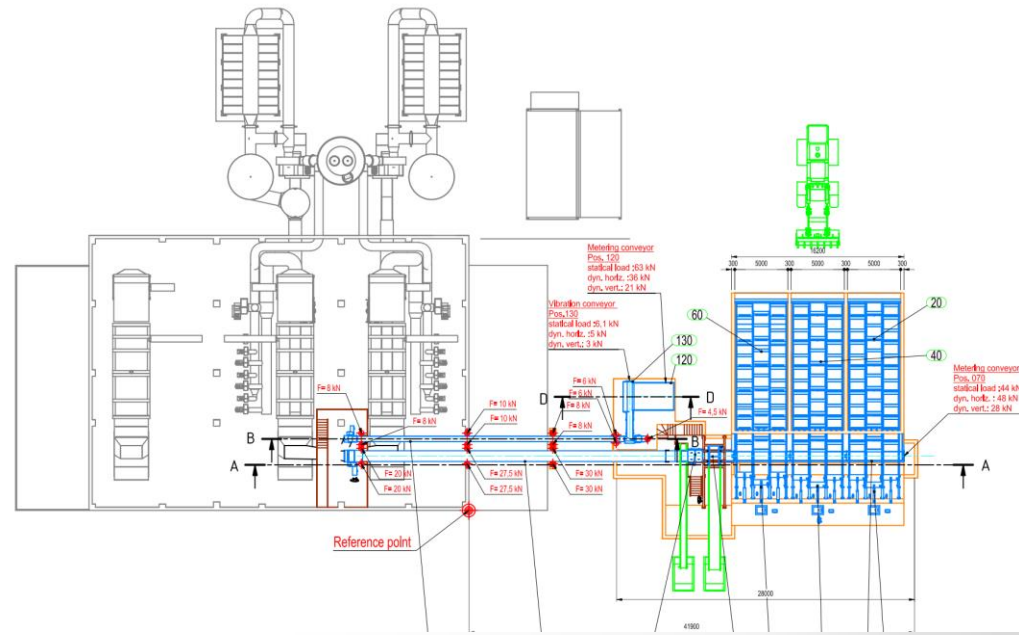
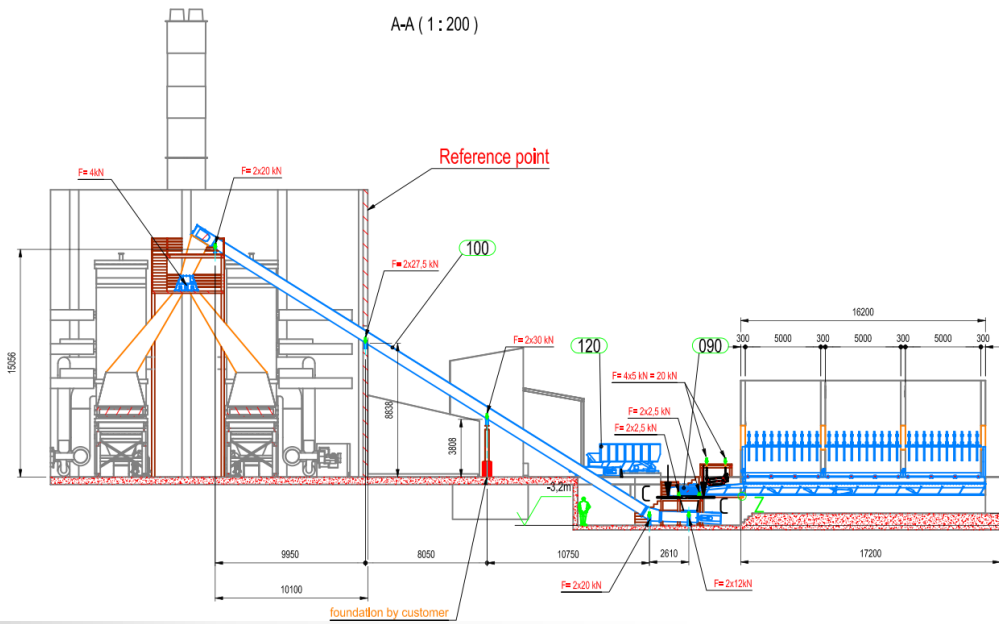




Side View



A-A (1:200)



Fuels

Lignite	Agriculture residues	WOOD CHIPS	AgroPellets	Oil
2300 kcal/Kg	3.000 kcal/Kg	3.500 Kcal/Kg	4.100 Kcal/Kg	12.000 Kcal/lt
2,5 Mwh/tn	3,5 Mwh/tn	4 Mwh/tn	4,7 Mwh/tn	11,6 Mwh/tn
34 €/tn	45 €/tn	60 €/tn	100 €/tn	1 €/lt
0, 4 tn	0,3 tn	0,25 tn	0,22 tn	130 lit
13,6 €/Mwh	15 €/Mwh	15 €/Mwh	21 €/Mwh	122 €/Mwh





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ΠΕΡΙΟΧΗΣ ΑΜΥΝΤΑΙΟΥ

(District Heating Company of Amyndeo – DHCA)

Thank you

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