

Technical Design and Planning of RES District Heating and Cooling (DHC) Training Course

Workshop 1 “Design and Planning”:

Day 1 –

Time	No.	Content	Speaker
9.00AM Registration			
9.15	1a	Introduction to course and SRF	Xavier Dubuisson, XD Consulting
9.40	1b	The steps in heat planning (mapping of consumption and resources, prediction of future consumption, district heating & cooling or individual heating and cooling, calculation of economical and environmental consequences). Introduction by PlanEnergi	PlanEnergi
09.50	Step 1 2a+b	Presentation of methods, including how to estimate heat demand based on m ² of buildings, standard consumption and applied heating technology. Estimation of future heat and cooling demand.	PlanEnergi
10.20	2c	Example from the region provided by local participants. If possible use of GIS based on local data. Local consultants find local data and methodology.	Codema – Donna Gartland
10.40	2d	Discussion of alternative methodologies – how to get a fair estimate of the demand without getting lost hunting data	All
10.45	Step 2 3a+b	Excess heat from industries, waste incineration and power production. Solar thermal, biomass, resources for biogas, heat resources for heat pumps <ol style="list-style-type: none"> 1. Reports on excess heat and organic waste (types) 2. Data from waste incineration plants 3. Solar radiation from the Danish Meteorological Institute 4. Biomass and biogas from spreadsheet from Aarhus University 5. Heat sources for large scale heat pumps 	PlanEnergi
11.10AM Break			
11.40		Discussion on what to include in Irish heat planning Maps.	
12.10	Step 3	Map of competitiveness (visualization), input data	PlanEnergi

	4a+b	and results (including local data if possible), methodology from 4DH. District heating & cooling or individual heating and cooling? Calculation of production prices for individual heating. Examples including data for costs for district heating and individual heating (calculation of heat production costs for different individual sources) for heating and cooling	
12.40		Design of case studies, general methodologies and cases. Presentation of tools (software programs and spreadsheets). Presentation of cases (applications of tools and results)	
13.10PM Lunch Break			
14.00	9a	Calculation of heat production costs, local economy, consumer economy and environmental benefits for a district heating (and cooling) plant.	PlanEnergi
14.25	9b 10	Local Sample costs	Irish team (TEA, Kerry Co Co & XD Consulting)
14.45	11	Group work 2 Use time for hands-on calculations by participants – to work out heat costs for sample projects.	All, process led by the Irish team.
15.15PM Break			
15.30		Presentation of group work	All, process led by the Irish team

Workshop 2: Design & construction of DH plants

Time	No.	Content	Speaker
9.00		Welcome – introduction to workshop 2Presentation of the program (overview over technical installations; installations in houses, transmission and distribution network, production technologies	PlanEnergi
9.15	2a+b	Installations in houses Diagrams for heating and cooling installations, direct and indirect district heating, prices of house installations, cooling, how to utilize low flow temperatures and secure low return temperatures, heat meter and working principles. Presentation of Danish examples by PlanEnergi	PlanEnergi – to presnet Danfoss slides as provided by Bill Carbery
10.00	2d	Group work 3 The calculations on the pipe losses given a sample calculation etc.	Xavier Dubuisson
10.40	2e	Includes calculations for Killarney	Irish team/ PlanEnergi
10.55PM Break			
11.10	3a+b+c	The transmission and distribution network	Isoplus (PlanEnergi)
11.40		Calculations for one Killarney	Isoplus (supported by Irish team and PlanEnergi)
12.15	4a+b	Presentation of technologies: Solar thermal, Biomass boiler, Biomass CHP, Biogas CHP, Heat pumps, Storage technologies	PlanEnergi
13.00 PM Break			
13.45	4b	Technical solutions, energy in- and output, prices for investment, operation and maintenance. Local data by local consultants for selected production plant	Paul Kenny, TEA
14.30	5	Calculation of district heating production plant costs	Anders Andersen, EMD
11.00AM Break			
15.00	6a	Group work Preparation of energyPRO and spreadsheet (installation), introduction to energyPRO before the workshop. Sample calculation, preparation of data by local partners for Killarney example	All, process led by Irish team & PlanEnergi/EMD
16.15	6b	District heat pump case study	Star Refridgeration/ paul Kenny
13.15PM Lunch			
16.45	7	Final presentation and discussion of results	
17.00PM Closing of Workshop			