| Input B_H_REFv1.5_demand | tab_supplytxt The Ene | ergyPLAN model 16.1 |
|--|--|--------------------------------|
| Electricity demand (TWh/year): Flexible demand0,00 | CHP 1017 82 0,21 0,47 Heat Pump maximum share 1,00 | Capacities Storage Efficiencie |
| Output District Heating | Electricity | Exchange |
| Demand Production Distr. Waste | Ba- Elec. Flex.& Elec- Hydro Tur- Hy- Geo- Waster | Balance Payment |

| | District Heating | | | | | | | | | | | | | | | | | | | Electr | icity | | | | | | | | Exchar | nge |
|----------|-------------------|-------|-------|-----|-----|----|-----|--------|----|--------------------------------|-------|----------|------|----------|------|-------|------|-----|-------|--------|-------|------|------|-------|-----|-----|------|-----|-----------|------|
| | Demand Production | | | | | | | | | Consumption Production Balance | | | | | | | | | | | | | | | | | | | | |
| | Distr. | | Waste | | | | | | | Ва- | Elec. | Flex.& | | Elec- | | Hydro | Tur- | | Ну- | Geo- | Wast | e | | Stab- | | | | | Paymer | |
| | heating | Solar | CSHF | DHP | CHP | HP | ELT | Boiler | EH | lance | demar | ıdTrans∤ | o HP | trolyser | EH | Pump | bine | RES | dro t | hermal | CSHF | CHP | PP | Load | Imp | Exp | CEEP | EEP | 1 ' | Exp |
| | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | % | MW | MW | MW | MW | Million E | EUR |
| January | 391 | 0 | 0 | 271 | 81 | 0 | 0 | 0 | 0 | 39 | 795 | 7 | 4 | 0 | 701 | 0 | 0 | 100 | 484 | 0 | 0 | 999 | 563 | 100 | 34 | 0 | 0 | 0 | 10 | 0 |
| February | 307 | 0 | 0 | 213 | 75 | 0 | 0 | 0 | 0 | 18 | 823 | 7 | 3 | 0 | 550 | 0 | 0 | 84 | 452 | 0 | 0 | 935 | 354 | 100 | 2 | 1 | 0 | 1 | 0 | 0 |
| March | 283 | 0 | 0 | 197 | 72 | 0 | 0 | 0 | 0 | 14 | 761 | 7 | 3 | 0 | 508 | 0 | 0 | 108 | 461 | 0 | 0 | 894 | 455 | 100 | 11 | 2 | 0 | 2 | 2 | 0 |
| April | 190 | 0 | 0 | 132 | 53 | 0 | 0 | 0 | 0 | 5 | 806 | 7 | 2 | 0 | 341 | 0 | 0 | 61 | 461 | 0 | 0 | 661 | 264 | 100 | 0 | 0 | 0 | 0 | 0 | 0 |
| May | 114 | 0 | 0 | 79 | 35 | 0 | 0 | 0 | 0 | 0 | 874 | 7 | 1 | 0 | 204 | 0 | 0 | 50 | 453 | 0 | 0 | 430 | 347 | 100 | 0 | 6 | 0 | 6 | 0 | 1 |
| June | 70 | 0 | 0 | 49 | 21 | 0 | 0 | 0 | 0 | 0 | 1010 | 7 | 1 | 0 | 126 | 0 | 0 | 59 | 484 | 0 | 0 | 267 | 465 | 100 | 0 | 0 | 0 | 0 | 0 | 0 |
| July | 48 | 0 | 0 | 33 | 15 | 0 | 0 | 0 | 0 | 0 | 1121 | 7 | 1 | 0 | 86 | 0 | 0 | 62 | 507 | 0 | 0 | 182 | 810 | 100 | 0 | 0 | 0 | 0 | 0 | 0 |
| August | 41 | 0 | 0 | 28 | 12 | 0 | 0 | 0 | 0 | 0 | 1080 | 7 | 0 | 0 | 73 | 0 | 0 | 58 | 512 | 0 | 0 | 153 | 946 | 100 | 0 | 0 | 0 | 0 | 0 | 0 |
| Septembe | | 0 | 0 | 43 | 19 | 0 | 0 | 0 | 0 | 0 | 1058 | 7 | 1 | 0 | 111 | 0 | 0 | 67 | 499 | 0 | 0 | 234 | 691 | 100 | 0 | 0 | 0 | 0 | 0 | 0 |
| October | 147 | 0 | 0 | 102 | 45 | 0 | 0 | 0 | 0 | 0 | 985 | 7 | 2 | 0 | 263 | 0 | 0 | 81 | 491 | 0 | 0 | 553 | 489 | 100 | 0 | 0 | 0 | 0 | 0 | 0 |
| Novembe | | 0 | 0 | 178 | 67 | 0 | 0 | 0 | 0 | 11 | 918 | 7 | 3 | 0 | 459 | 0 | 0 | 85 | 487 | 0 | 0 | 829 | 578 | 100 | 4 | 0 | 0 | 0 | 1 | 0 |
| Decembe | r 315 | 0 | 0 | 219 | 76 | 0 | 0 | 0 | 0 | 20 | 924 | 7 | 4 | 0 | 565 | 0 | 0 | 109 | 454 | 0 | 0 | 945 | 536 | 100 | 36 | 5 | 0 | 5 | 7 | 1 |
| Average | 185 | 0 | 0 | 129 | 48 | 0 | 0 | 0 | 0 | 9 | 930 | 7 | 2 | 0 | 332 | 0 | 0 | 77 | 479 | 0 | 0 | 589 | 543 | 100 | 7 | 1 | 0 | 1 | Average | |
| Maximum | 610 | 0 | 0 | 424 | 82 | 0 | 0 | 0 | 0 | 104 | 1578 | 13 | 7 | 0 | 1094 | 0 | 0 | 233 | 534 | 0 | 0 | 1017 | 1721 | 100 | 448 | 478 | 0 | 478 | (EUR/N | ЛWh) |
| Minimum | 9 | 0 | 0 | 6 | 3 | 0 | 0 | 0 | 0 | 0 | 65 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 0 | 100 | 0 | 0 | 0 | 0 | 306 | 195 |

| FUEL BAI | LANCE (| TWh/ye | ar): | | | | | | Waste | / CAES | BioCon | -Electro |)- | PV and | d Wind c | off | | | | Industr | ТУ | Imp/Exp | Corrected | CO2 em | ission (Mt |
|-----------|---------|--------|------|---------|-------|-------|-------|----------|-------|---------|---------|----------|------|--------|----------|-------|-------|-----------|----------|----------|---------|---------|-----------|--------|------------|
| | DHP | CHP2 | CHP3 | Boiler2 | Boile | r3 PP | Geo/N | lu.Hydro | HTL | Elc.ly. | version | Fuel | Wind | CSP | Wave | Hydro | Solar | .Tr Trans | sp.house | h.Variou | s Total | Imp/E | xp Net | Total | Net |
| Coal | 0,38 | - | 0,84 | - | - | 17,77 | - | - | - | - | - | - | - | - | - | - | - | - | 1,15 | 8,29 | 28,43 | 0,19 | 28,62 | 9,72 | 9,79 |
| Oil | 0,38 | - | - | - | - | 0,05 | - | - | - | - | - | - | - | - | - | - | - | 13,43 | 0,41 | 3,18 | 17,45 | 0,00 | 17,45 | 4,65 | 4,65 |
| N.Gas | 0,28 | - | - | - | - | 0,02 | - | - | - | - | - | - | - | - | - | - | - | 0,82 | 0,71 | 1,99 | 3,82 | 0,00 | 3,82 | 0,79 | 0,95 |
| Biomass | 0,22 | - | 0,04 | - | - | 0,01 | - | - | - | - | - | - | - | - | - | - | - | - | 13,47 | 0,59 | 14,33 | 0,00 | 14,33 | 0,00 | 0,00 |
| Renewab | e - | - | - | - | - | - | - | 4,21 | - | - | - | - | 0,16 | 0,08 | - | 4,64 | - | - | - | - | 4,88 | 0,00 | 4,88 | 0,00 | 0,00 |
| H2 etc. | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 |
| Biofuel | - | - | 0,00 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 |
| Nuclear/C | CS - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 |
| Total | 1,25 | - | 0,88 | - | - | 17,84 | - | 4,21 | - | - | - | - | 0,16 | 0,08 | - | 4,64 | - | 14,25 | 15,74 | 14,06 | 68,91 | 0,19 | 69,10 | 15,16 | 15,39 |

TWh/year 1,63 0,00 0,00 1,13 0,42 0,00 0,00 0,00 0,00 0,08 8,17 0,06 0,02 0,00 2,91 0,00 0,00 0,68 4,21 0,00 0,00 5,18 4,77

-13-mart-2022 [15:29]

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0,06 0,01 0,00 0,01

| Output specifications | B_H_REFv1.5_demand_tab_supplytxt |
|-----------------------|----------------------------------|
|-----------------------|----------------------------------|

The EnergyPLAN model 16.1

| District Heating Production | | | | | | | | | | | | | | | | | | | | | 1 all | > | | | | | | | |
|-----------------------------|----------|--------|------|------|----------|-------|------|------|------|------|--------|------|-------|-------|----------|-------|------|------|------|------|--------|------|-------|-------|-------------------|---------|---------|-------|-------|
| | G | Gr.1 | | | | | | | | Gr.2 | | | | | | | | | Gr.3 | | | | | | RES specification | | | | |
| | District | | | | District | | | | | | | | Stor- | Ва- | District | | | | | | | | Stor- | Ва- | RES1 | RES2 | RES3 | RES 1 | Total |
| | heating | Solar | CSHP | DHP | heating | Solar | CSHP | CHP | HP | ELT | Boiler | EΗ | age | lance | heating | Solar | CSHF | CHP | HP | ELT | Boiler | EΗ | age | lance | Wind | Photo I | River I | 4-7 ɔ | |
| | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MV |
| January | 271 | 0 | 0 | 271 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 119 | 0 | 0 | 81 | 0 | 0 | 0 | 0 | 0 | 39 | 18 | 7 | 75 | 0 | 100 |
| February | 213 | 0 | 0 | 213 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 94 | 0 | 0 | 75 | 0 | 0 | 0 | 0 | 0 | 18 | 23 | 8 | 54 | 0 | 84 |
| March | 197 | 0 | 0 | 197 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 86 | 0 | 0 | 72 | 0 | 0 | 0 | 0 | 0 | 14 | 29 | 8 | 71 | 0 | 108 |
| April | 132 | 0 | 0 | 132 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 58 | 0 | 0 | 53 | 0 | 0 | 0 | 0 | 0 | 5 | 19 | 11 | 31 | 0 | 6′ |
| May | 79 | 0 | 0 | 79 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 10 | 20 | 0 | 50 |
| June | 49 | 0 | 0 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 12 | 35 | 0 | 59 |
| July | 33 | 0 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 13 | 38 | 0 | 62 |
| August | 28 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 12 | 34 | 0 | 58 |
| Septembe | er 43 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 10 | 42 | 0 | 67 |
| October | 102 | 0 | 0 | 102 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 0 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 8 | 57 | 0 | 81 |
| Novembe | r 178 | 0 | 0 | 178 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 78 | 0 | 0 | 67 | 0 | 0 | 0 | 0 | 0 | 11 | 17 | 7 | 61 | 0 | 85 |
| Decembe | er 219 | 0 | 0 | 219 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 96 | 0 | 0 | 76 | 0 | 0 | 0 | 0 | 0 | 20 | 27 | 3 | 79 | 0 | 109 |
| Average | 129 | 0 | 0 | 129 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 0 | 0 | 48 | 0 | 0 | 0 | 0 | 0 | 9 | 18 | 9 | 50 | 0 | 77 |
| Maximum | 1 424 | 0 | 0 | 424 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 186 | 0 | 0 | 82 | 0 | 0 | 0 | 0 | 0 | 104 | 87 | 35 | 172 | 0 | 233 |
| Minimum | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | (|
| Total for t | he whol | e year | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TWh/year | | - | 0,00 | 1,13 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | | 0,00 | 0,50 | 0,00 | 0,00 | 0,42 | 0,00 | 0,00 | 0,00 | 0,00 | | 0,08 | 0,16 | 0,08 | 0,44 | 0,00 | 0,68 |

Own use of heat from industrial CH0,00 TWh/year

| | | | | | | | | | NAT | URAL GA | AS EXCH | ANGE | | | | | | |
|-------------------------------|------|--------------|---------|------|------|--------|-------|-------|-------|---------|---------|-------|-------|-------|-------|------|------|------|
| ANNUAL COSTS (Million EUR | 2) | | DHP & | CHP2 | PP | Indi- | Trans | Indu. | Deman | d Bio- | Syn- | CO2Hy | SynHy | SynHy | Stor- | Sum | lm- | Ex- |
| Total Fuel ex Ngas exchange = | 0 | | Boilers | CHP3 | CAES | vidual | port | Var. | Sum | gas | gas | gas | gas | gas | age | | port | port |
| Uranium = 0 | | | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW | MW |
| Coal = 0 | | lanuan/ | 67 | 0 | 6 | 171 | 4 | 239 | 485 | 0 | 0 | 0 | 0 | 0 | 0 | 485 | 485 | 0 |
| FuelOil = 0 | | January | | | | | 1 | | | | 0 | | | | | | | ٥ |
| Gasoil/Diesel= 0 | | February | 53 | 0 | 3 | 134 | 1 | 259 | 451 | 0 | 0 | 0 | 0 | 0 | 0 | 451 | 451 | 0 |
| Petrol/JP = 0 | | March | 49 | 0 | 4 | 124 | 1 | 242 | 420 | 0 | 0 | 0 | 0 | 0 | 0 | 420 | 420 | 0 |
| Gas handling = 0 | | April | 33 | 0 | 1 | 83 | 1 | 193 | 311 | 0 | 0 | 0 | 0 | 0 | 0 | 311 | 311 | 0 |
| Biomass = 0 | | May | 20 | 0 | 0 | 50 | 1 | 172 | 243 | 0 | 0 | 0 | 0 | 0 | 0 | 243 | 243 | 0 |
| Food income = 0 | | June | 12 | 0 | 0 | 31 | 1 | 139 | 184 | 0 | 0 | 0 | 0 | 0 | 0 | 184 | 184 | 0 |
| Waste = 0 | | July | 8 | 0 | 1 | 21 | 1 | 159 | 191 | 0 | 0 | 0 | 0 | 0 | 0 | 191 | 191 | 0 |
| vvasie – 0 | | August | 7 | 0 | 2 | 18 | 1 | 112 | 140 | 0 | 0 | 0 | 0 | 0 | 0 | 140 | 140 | 0 |
| Total Ngas Exchange costs = | 0 | Septembe | r 11 | 0 | 1 | 27 | 1 | 156 | 196 | 0 | 0 | 0 | 0 | 0 | 0 | 196 | 196 | 0 |
| | • | October | 25 | 0 | 2 | 64 | 1 | 383 | 476 | 0 | 0 | 0 | 0 | 0 | 0 | 476 | 476 | 0 |
| Marginal operation costs = | 0 | November | 44 | 0 | 5 | 112 | 1 | 267 | 429 | 0 | 0 | 0 | 0 | 0 | 0 | 429 | 429 | 0 |
| Total Electricity exchange = | -848 | December | 54 | 0 | 5 | 138 | 1 | 391 | 590 | 0 | 0 | 0 | 0 | 0 | 0 | 590 | 590 | 0 |
| Import = 20 | | | | | • | 0.4 | | 000 | 0.40 | • | • | • | • | • | • | 0.40 | 0.40 | |
| Export = -2 | | Average | 32 | 0 | 2 | 81 | 1 | 226 | 343 | 0 | 0 | 0 | 0 | 0 | 0 | 343 | 343 | 0 |
| Bottleneck = 0 | | Maximum | 105 | 0 | 11 | 268 | 1 | 739 | 866 | 0 | 0 | 0 | 0 | 0 | 0 | 866 | 866 | 0 |
| Fixed imp/ex= -866 | | Minimum | 2 | 0 | 0 | 4 | 1 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 8 | 0 |
| · · | • | Total for th | e whole | year | | | | | | | | | | | | | | |
| Total CO2 emission costs = | 0 | TWh/year | | 0,00 | 0,02 | 0,71 | 0,01 | 1,99 | 3,02 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 3,02 | 3,02 | 0,00 |
| Total variable costs = | -848 | , | - | • | • | • | - | • | • | • | • | | • | • | • | • | • | • |

-848 RES Share: 27,9 Percent of Primary Energy 47,0 Percent of Electricity

0

Fixed operation costs = Annual Investment costs =

TOTAL ANNUAL COSTS =

5,1 TWh electricity from RES

13-mart-2022 [15:29]