

# Heat Pumps as part of RES and Energy saving goals in Finland

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# ESD and RES Directives

- Energy Services Directive (2006/32/EC)
  - National indicative 9 % energy saving target for 2016
  - Finland's energy saving target 17,8 TWh
  - Directive period 2008-2016, savings from early measures can be included
  - National Energy Efficiency Action Plans 2007, 2011, 2014, (2017)
  - Part of RES can be calculated as energy savings (locally produced)
- RES Directive (2009/28/EC)
  - Finland's target for renewable energy 38 % in 2020
  - Final consumption in Climate and Energy Strategy from 347 to 310 TWh (-37 TWh)
  - 38 TWh increase needed, based on 327 TWh (17 TWh "safety" marginal)
  - Reduction in GHG emissions -16 % outside the ETS sectors
  - National RES Actions Plans to be developed, first by June 2010
- Energy savings will contribute to the RES target and likewise
  - More final energy consumption, more RES needed – less final energy, less additional RES needed



# Heat Pumps delivering energy savings and RES

- National Energy Efficiency Action Plan as reported in 2007
  - 0,9 TWh (2007), 1 5 TWh (2010), 2,1 TWh (2013) and 2,5 TWh (2016)
  - Heat pumps expected to deliver 14 % of total savings target in 2016
- Checking the possible RES amount in 2008 – update on energy savings
  - 2,4 TWh (2010), 3,7 TWh (2013), 4,9 TWh (2016), 6,1 TWh (2020)
  - Conservative figures... to be on the safe side ~3,5...4,0 TWh in 2016
  - Heat pumps to deliver 20...25 % of total ESD energy saving target in 2016
  - Sales volumes are expected to be very good even almost totally market driven
- In Finland's National "RES package"
  - Heat pumps to deliver 8 TWh in 2020 as some 2 TWh in national statistics in 2005
  - Previous target for heat pumps 6 TWh in 2020
- Meeting the RES target?
  - Much depend on the calculation methodology on SPF and guidelines



# Three viewpoints

- Theoretical
  - In cold climates the SPF of a HP is lower than in average climates and much lower than in warm climates
  - In cold climates SPF 2,9 is extremely high level to reach by air-source HPs
- Practical
  - In cold climates high demand for heat – also the amount of heat delivered by a HP
  - In cold climate heating/cooling ratio is 90/10...95/5, in warm climate the opposite
  - Air-to-air HP installed into a building with electric heating has a significant effect to GHG emissions – more or less regardless of the SPF of the HP
- Political
  - Principles can just be agreed upon – even if theoretically not fully correct
  - Also at national level – sometimes the theoretically correct option is too complicated
  - Average figures sometimes necessary, but easily problematic – as the EU average electricity production efficiency when defining the SPF as eligibility criteria
  - Bulls can be calculated as cows – if all or majority agree to do so, but we should then understand how this works with the target setting...



# Some work to do with the guidelines...

- The requirement for a HP is to deliver +15 % more energy than the HP use electricity converted to primary energy - to be eligible to produce “RES energy”
- With 40 % electricity production efficiency the SPF threshold value is 2,875
- With 52 % production efficiency and with the SPF 2,875 as eligibility criteria the "more than" requirement is not +15 % but +50 %
- On the other hand in warm climate the SPF 2,875 is met easily and if national electricity production efficiency is less than 40 %, then the +15% requirement is not met?
- Political viewpoint has affected to the eligibility criteria – simplifying a complicated issue
- Therefore the development of guidelines on the calculation methodology “RES from heat pumps” cannot be based purely on theoretical viewpoint
- In any case the methodology will be affected by a strong practical viewpoint – what data will be available...



# Some concrete measures to promote HPs

- Tax deduction for households
  - As part of Finland's Household Tax Deduction system the households can deduct tax up to 3000 € (or 6000 € if both deduct) from the installation (work) cost
  - No incentives for the equipment – needs to be paid 100 % by the household
- Subsidies for municipalities and enterprises
  - Precondition is accession to Energy Efficiency Agreement Scheme 2008-2016
  - Subsidies available for the heat pump and all installation work needed, subsidy level normally 25 % - interpreted as an energy saving measure in an existing bldg.
  - Costs related to installation or refurbishment of building's internal heating system itself are not eligible (e.g. radiators, piping etc.)
  - Exceptions are ESCO-projects where the EEA is not required but then the subsidy level is 15 % and new technology where also new buildings are eligible (rare case)
- Planned: air-to-air heat pumps to be eligible also, but only to municipalities and enterprises within the EEA and when installed into a building with electric heating

