Nearby use of renewable energy sources – an alternative for on-site production

Definition of nearby renewable energy production was lively discussed during CLIMA 2013 congress in Prague. nZEB workshop at CLIMA 2013 revealed that the only available, somewhat complete nearby definition is the REHVA definition, published in REHVA REPORT NO 4, some specification is also available in draft overarching EPBD standard prEN15603:2013.

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CEN definition

"Nearby" is addressed in EPBD recast stating that a very significant amount of energy used in nZEB buildings has to come from renewable sources produced on site or nearby. In prEN 15603:2013 "nearby" is defined as an energy source which can be used only at local or district level and requires specific equipment for the assessed building or building unit to be connected to it (e.g. district heating or cooling), **Figure 1**. Allocation to the building is not defined through the contractual and ownership questions, but just by the connection (cable or pipework). The possibility to use different primary energy factors than these of distant production is mentioned but not further specified.

REHVA definition

REHVA definition, which is 100% technology neutral, allows also to utilize a public grid, and puts more focus to allocation to the building, **Figure 2**. Nearby production is defined as thermal energy, or electricity which is distributed through a specific or public network (located outside the building site). It is distinguished that for example for district heat (which is by the definition nearby production) two cases exists. If just connected to district heating network as a common client (fulfills prEN15603:2013 requirement of the physical connection), the primary energy factor of the district heating network mix has to be used. In such a case there is no difference to "distant", i.e. district heat is just considered as any other delivered energy carrier. (This is also a problem of prEN15603:2013 specification, where the difference between nearby and distant is not clearly de-

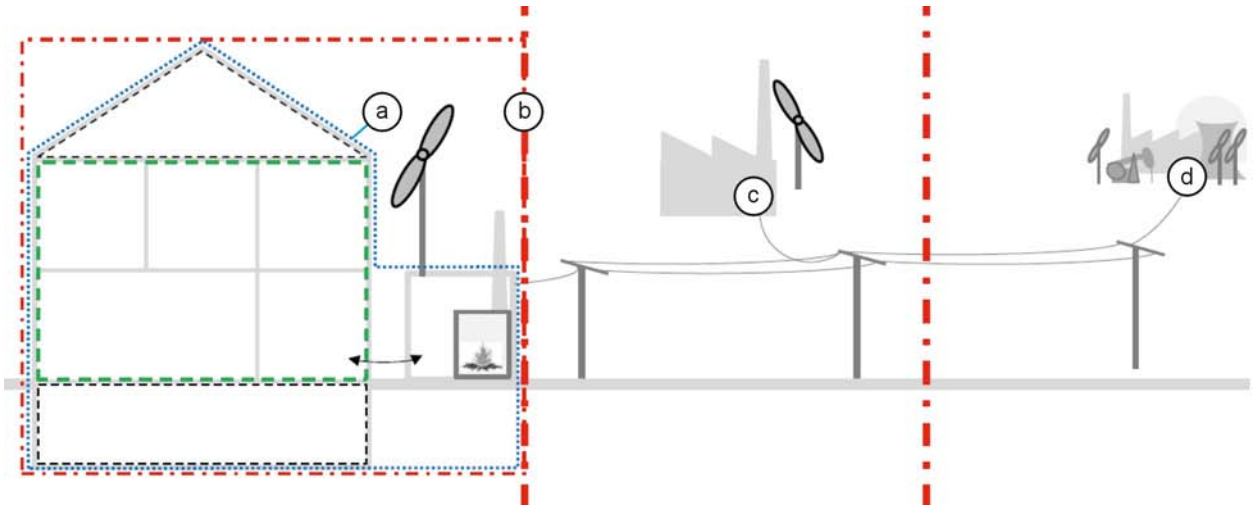

Figure 1. prEN15603:2013 defines energy balance of a building (a), on site perimeter (b), nearby (c) and distant energy production (d).

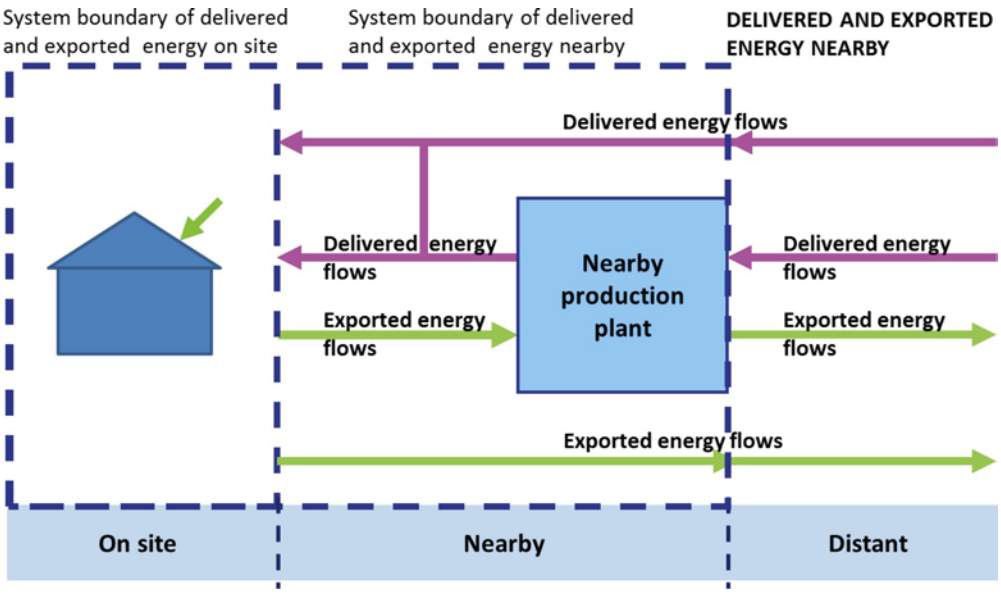

Figure 2. REHVA definition provides for nearby production invested by the building owner an equal treatment compared to on site production. There are no technology limitations, a public grid or district heating or cooling networks can be also used to connect a new renewable energy capacity to the building and to utilize with a primary energy factor related to this new capacity.

fined.) Another, the actual nearby case, is to link contractually the new district heat plant capacity, invested by the building owner (a share of a new plant or a modernized existing one with a new renewable fuel), to the building. In such a case, the primary energy factor of a new plant or modernized existing one can be used, and this can be much lower compared to the district heating network mix. The same principle applies for any kind of nearby production in REHVA definition. Another good example is the share of a wind farm – a building owner can invest and utilize corresponding wind electricity with low primary energy factor.

Extended "near by renewable" definition needed for large buildings

Strongest need for nearby production was seen in larger developments or high rise buildings. When speaking about nZEB houses, on site solutions are easy to use. But in larger buildings, on site solutions may be less efficient (at least on energy system level) and more expensive compared to nearby ones. Therefore developers and construction companies need tools, definitions and regulations to consider nearby solutions. If cannot be utilized in energy performance certificates and compliance assessment, nearby solutions will not be competitive. Wider importance of nearby solutions was seen as to provide a real addition to renewable energy production capacity and it was generally recognized that "nearby" needs more regulatory effort compared to on site solutions.

To utilize REHVA nearby definition, corresponding regulatory framework is needed. It must be possible to allocate the new capacity to the building for a long term, which could be a service lifetime of the plant, needed also to be defined nationally. Otherwise there will be a risk of green wash renewable energy products, which may not be based on new renewable energy capacity, i.e. not making a real addition to renewable energy production.

Flexible definition will increase the use of renewables

It is important to notice, that two described nearby options (a common client vs. investment to new capacity) have basically no differences regarding the maintenance and operation of the plants. In any case, whatever nearby plant will need an operator as out of site and serving many buildings. Operation and maintenance cost is usually included in the energy price, as it is today for district heat or grid electricity. Because "nearby" energy may be more expensive than that the district heating mix, there are duties for both sides. The client has to commit to buy renewable energy and the provider to produce and maintain the plant.

Until national regulations can catch up the nearby possibility launched by EPBD, the only way for developers and construction companies seems to buy the renewable energy certificates from energy companies and require to delete these after the contract is done – then this capacity is allocated to the building for a contract period and the building owner has to pay in addition to the investment for renewable energy to energy company. Indeed, such nearby renewable energy, invested by the building owner, cannot be utilized in the primary energy indicator calculation, until not included in the regulation. ■

References: See the complete list of references of the article in the html-version at **www.rehva.eu** -> REHVA Journal