

In the case of Barcelona's renewable energy, there are 2 diagrams created. Actually, both of the diagrams giving the same information but from different point of views.

First diagram, which is named as "Per/Pub" (personal to public), is starting from the main energy consumption in a dwelling and showing the steps of the energy distribution network in scale of people.

At this case, main energy needs of a dwelling is determined as; Electricity, Heating, Fuel and Gas. At this diagram; you can see what one person needs in terms of electricity, heating, fuel and gas. These needs are named like:

+ *For 1 person*; "personal use" (same for electricity, heating, fuel and gas).

+ *For 10 people*; "domestic usage" (for electricity, heating and gas) and "fuel tank" (for fuel).

+ *For 100 people*; "residential network" and "transfer substation" (both for electricity), "central heating" (for heating), "fuel station" (for fuel) and gas pipeline (for gas).

+ *For 1000 people*, "generator", "district heating network" and "inverter" (for electricity), "heat distribution center" (for heating), "fuel station" (for fuel) and "gas storage" (for gas).

+ *For 10.000 people*; "alternator" and "charge regulator" (for electricity) and "digester" (for gas).

This information can exactly be given until 10.000 people, after this point, the network is generally doesn't have stops, just transmission lines and these lines doesn't benefit users directly.

At the point of 10 million people, you can see where the electricity / fuel / gas / heat that you are using are coming from. The source can be "biomass", "hydroelectric", "eolic" or "solar" energy systems. Also, you can see the connections between them. For example, your electricity network is the same until the point of 100 people. After this point, your network is divided into two and one source (biomass) is using another network than the other sources (eolic, solar, hydroelectric). And then both every type of source and every type of need is divided into their own networks and the diagram is getting more complex.

At the end, you can see main resources of Barcelona that is providing energy. In this case, main sources of Barcelona are;

- + La Baells Dam and Sau Dam (for hydroelectric energy)
- + Trucafort - L'Enderrocada Wind Farm, Les Colladetes Wind Farm and Baix Ebre - Monte Buinaca Wind Farm (for eolic energy)
- + Domestic Solar Panels and Forum 2004 Urban Solar FV Station (for solar energy)
- + Local Biomass Production Centers (for biomass energy)

Second diagram, which is named as "Pub/Per" (public to personal) is analyzing energy network of Barcelona from reverse side, taking the topic from public size and bringing to personal size. This diagram is consisting of rings, which are symbolizing Barcelona user and resources. This rings which are used in scale due to capacity, consumption and population, makes this diagram easy to compare with other cities and resources.

This diagram is starting from the energy sources (solar, eolic, biomass and hydroelectric) and coming to city scale. The main key point of is you can understand the distance of source to the user. The example can be given as; Domestic Solar Panels ring is inside Barcelona User ring, it means that domestic solar panels are inside Barcelona. On the other hand, Sau Dam is far from Barcelona city center (95 km), so this ring is placed in the scale of its distance to city center.

Also, similar to previous diagram, you can see the steps/stops of energy distribution network inside every ring.

Personal usage + Domestic usage + Transfer substation + Inverter + Charge Regulator [Network for Solar Energy]

Personal usage + Domestic usage + Transfer substation + Inverter + Charge Regulator [Network for Hydroelectric Energy]

Personal usage + Domestic usage + Residential Network + Generator + Gas Storage + Digester [Network for Biomass Energy]

Personal usage + Domestic usage + Transfer substation + Inverter + Charge Regulator [Network for Eolic Energy]

References for Barcelona Renewable Energy Distribution Network Diagram:

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