According to estimations up to 90 % of all information can be defined in terms of a location and placed on a map. This seems to apply also to energy: not only to the production, transfer, consumption and storing of energy, but to its saving, wasting and recycling, as well.

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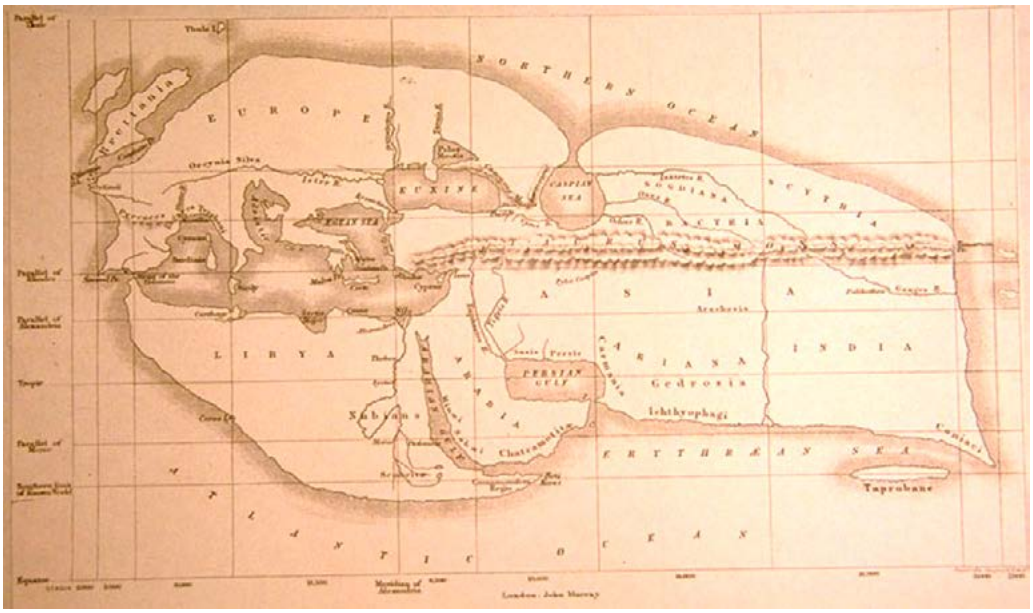
MORE ENERGY ON A MAP

Ari Laitala

Kirjoituksen englanninkielinen versio on luettavissa oheisen QR-koodin kautta.

ERATOSTHENES' WORLD MAP dating back to 194 BC. A long journey has been made to modern GIS-applications. Eratosthenes map was however a long period world´s most sophisticated map where also latitudes and longitudes were presented at first time. Eratosthenes is considered as a father of cartography and whole geography. He also concluded Earth being as a sphere and calculated circumference of Earth somewhat precisely by the method he developed. Anyway the idea of the sphere Earth seems to be ignored in this map.

(A 19th century reconstruction of Eratosthenes' map, Bunbury, E.H.,/Eratosthenes | Wikimedia Commons, PD)



THERE IS AN ENERGY TRANSITION going on. One manifestation is localisation of energy production. Examples are related to ground heat, heat pumps in general and recovery of solar energy as electricity but as a heat as well. Exploitation of wind energy is a whole different story which generalisation has presumably affected by the publication of Finnish Wind Atlas in 2009.

In addition – to bigger atlas style material – new kind of spatial datasets seem to be generated in accelerated pace, as an outcome of different kind of development ventures and projects. Amount of open data is growing and by combining different data sets new even large materials can be produced by reasonable complaint.

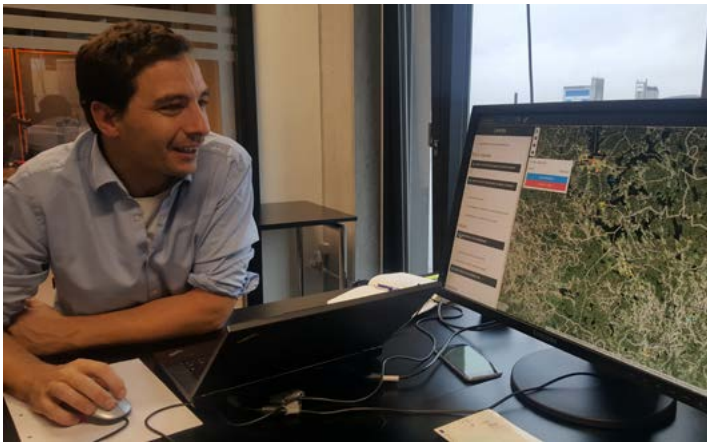
Also new technical platforms seem to be available in larger amounts. For example in the site https://gisgeography.com/free-gis-software/ 13 free gis software are presented. And quite a special case is project Open Street Map, a kind of Wikipedia of spatial data. The project started in 2004 and has come o the phase where at least hundreds of applications are based on data gathered in the project.

ENERGY IN HORIZON

EU's Horizon 2020 research program has funded several research projects, where goal is to map excess heat sources and developed them to spatial data. Later, perspectives have widened and need for cooling solutions and infra development have emerged. Common factor for the projects seem to be the question how demand and supply could face better. It is not only question of location but also seasons and weather conditions may have a strong effect on incidence. To all appearances in Europe – as well as in Finland – we are still far away from optimal energy usage. This seems to touch efficiency of the energy end use like efficiency on production and transfer as well. It is not only decarbonisation but a matter of money as well.

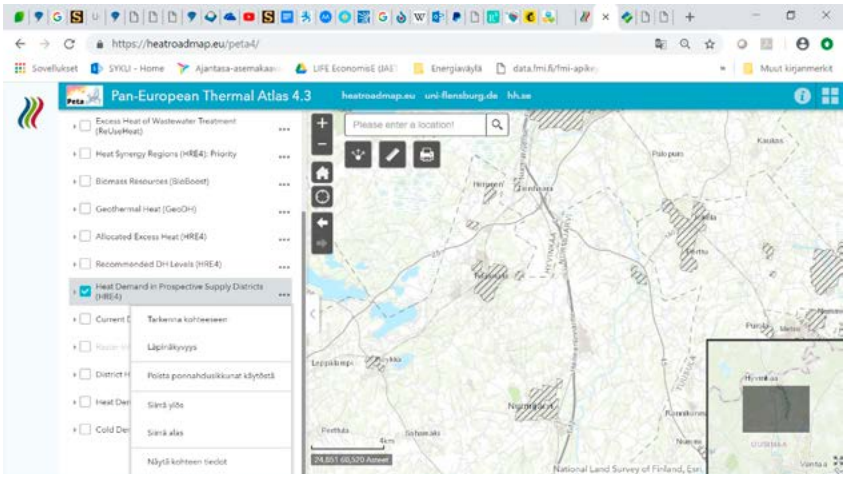
CONFERENCE Smart Energy Systems and 4thGeneration District Heating was held in Aalborg in Denmark on 13 to 14 November 2018. Day before the actual conference a workshop was organised by the projects Heat Roadmap Europe, Hotmaps, PLANHEAT and THERMOS where the common target is to create spatial data for more efficient energy usage.

MICHAEL HARTNER from TU WIEN demonstrates HOTMAPS toolbox functionalities and data sets of southern Finland. In the project open source GIS application is develop, which can be used to estimate heating and cooling demand and supply in local regional and national level. It is also possible to get estimation whether centralized district heating/cooling solution is more profitable than decentralised solutions. Data set is covering all the current member states so HOTMAPS toolbox is EU28 compatible. Toolbox is tested in seven pilot areas of which only Aalborg is located in Nordic countries. For further information see https://www.hotmaps-project.eu/hotmaps-project/.



HRVOJE DOROTIĆ from PLANHEAT project introduces audience to PLANHEAT project. There are some common features compared to other mentioned projects and their tools in these four projects. In this application more attention seems to be put to the scenario and simulation features. Three validation cities are chosen to test features and to receive feedback after updates. Cities are Antwerp (BE), Lecce (ITA) and Velika Gorica (CRO). There are also numerous open opportunities to train the tool and familiarize to How-To Tutorials, guidelines etc. and take part webinars and workshops. For further information see http://planheat.eu/.

STEFFEN NIELSEN from THERMOS project presenting participating countries of the project. In THERMOS focus seems to be in heating/cooling network planning tools. It can be used to optimise totally new heating/cooling grids, their length and routes and locations as well as to optimise enlargements of the existing networks. Most of the actual project partners are large organizations like ICLEI (Local Governments for Sustainability). ICLEI is a global association of over 1,500 cities, towns, and metropolises in 86 countries. Also some biggest cities in Finland are members of ICLEI.



PROJECT HRE4 (Heat Roadmap Europe) has most developed results among mentioned four projects. Map service PETA (Pan-European Thermal Atlas", Flensburg, Halmstad and Aalborg Universities 2018 has been open already for some years. In the recent conference in Aalborg version 4.3 was launched including new map layers. In the screen capture above a map layer representing potential areas for centralised heating solutions is active. Some of covered areas provide district heating and for smaller areas a small scale solution would be possible.

PROFESSOR HENRIK LUND (DEN) speaks about concept of smart energy at Aalborg. Lund is one of the developers of 4th generation district heating. 4th generation is characterized by low temperature technologies and bi-directional heat inter alia. Also exploitation of renewable energy in larger scale is essential in 4th generation and combines the concept closely to land use solutions. For example invocation of geothermal heat and solar energy may require comments already in the zoning phase when planning new areas. Scheme of things in 4th generation includes also seasonal thermal storing, for example to ground as part of geothermal energy solutions. By applying new kind of technology and approaches it seems possible that in between traditional centralized district heating systems and single building level solutions there is a niche for smaller low temperature heating grids. Also cooling solutions are in future more topical at least in southern Finland and are part of 4th generation thinking.