

Scenarios on energy sufficiency and societal transformations: changing lifestyles and social structures to make energy savings

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Abstract

Economic and ecological crises challenge development models, in terms of production and consumption. Because of the environmental context and to reduce dependency on fossil fuels and nuclear energy, French government has decided to make an energy transition, as well as various European countries, reducing energy consumption and moving away from fossil fuels and nuclear energy towards a sustainable economy built as much as possible on renewable energy. Governments are focusing their strategies on renewable energies for energy supply, and on energy efficiency to reduce energy demand. However, energy savings potentials from energy sufficiency options and practices are dismissed, whereas lifestyles and social structures have a significant impact on energy consumption.

To reduce energy consumption, energy efficiency can help to relieve pressure on resources. However, energy savings goals could not be achieving only through technical solutions, which require time to set up, raw materials, industrial process and consequently energy. Indeed, energy consumption depends still more on organization of society than on technical progress. In this context, energy sufficiency, which means reducing the needs of energy through individual and collective options and practices, appears as a complementary solution to technical options to adapt energy demand on energy produced by energy sources based on flows (renewable energies) rather than stock (fossil fuel, nuclear energy). Energy transition is strongly linked to wider societal change.

Depending on changes in social structures and cultural practices, including habits, lifestyles or social norms, how much energy could be saved? To answer this question, in 2012, the NGO Virage-énergie Nord-Pas de Calais decided to start a research project focused on energy transition as societal transition, in partnership with two academic laboratories : TVES (University of Lille 1 - Science and Technologies) and Ceraps (University of Lille 2 - Health and Law). By creating prospective energy scenarios, the aim of this research was to evaluate, using data models and assumptions, the energy savings potentials from public policies and lifestyle changes. Scenarios suggest visions and pathways for societal transformations and quantify energy savings potentials. With this work, Virage-énergie Nord-Pas de Calais intends to support political decision making and to raise public awareness of energies challenges and benefits of energy sufficiency.

Prospective scenarios consider energy sufficiency actions on energy uses of the population of the Nord-Pas de Calais (more than four million inhabitants). Four topics have been considered relative to needs which require practically the entirety of energy consumed today: feeding ourselves, manufacturing material goods, moving and using buildings.

First step was to quantify energy required by population during a year : producing all food products, supplying with food, manufacturing all equipments, travelling, going to work, heating spaces and using equipments as well as in housing, in office and commercial buildings, cooking,

producing hot water, etc. By focusing on mobility, housing, agriculture, work or materials flows, the aim of this quantification was to evaluate links between energy and current societal metabolism. Before modeling impacts of energy sufficiency on energy consumption, sufficiency was declined into six strategic axes describing transition from current state to a “low energy state”. Theoretical approach, based on literature review, has shown that energy sufficiency involves various options relative to decentralization, shared services, gift economy, etc.

Then, this study, focused on energy demand, has considered various options and practices of energy sufficiency : changing eating habits; reducing overconsumption and waste, reducing consumption of consumer goods ; choosing the right size, dimension and power rate when buying equipment; adjusting level and duration of use of an equipment to real need, sharing the use of an equipment among several users; reducing distances needed for the same service; new organization of services; adaptation of production and distribution networks; better adaptation of vehicles to their use (size, weight, speed, ...); reducing the surface per person in housing (priority to small collective house, living together, ...) as well as in office and commercial buildings, etc.

Two scenarios have been realized in order to evaluate energy-saving potentials under various visions and trajectories. One scenario was called “soft sufficiency” and the other “radical sufficiency”. Assumptions of each scenario have been decided by a working group, composed of researchers and citizens.

By making assumptions on lifestyles, habits or collective organization, scenarios results show that energy sufficiency represents a significant potential for energy-savings. Energy sufficiency allows reducing energy consumption from 26% to 40%. Dozens of terawatt-hours could be saved by easy and low-cost actions and then almost immediately. Regarding to energy challenges, sufficiency contributes to increase local resilience. Sufficiency could either speed up and/or raise energy transition governmental targets.