

Abstract

The paper focuses on reducing carbon emissions and energy demand in the urban environment – by households, local businesses and local authorities – and increasing small and medium scale generation of renewable energy. In other words, promoting ‘generation’ of Negawatts and green Megawatts. The paper identifies the challenges and barriers to changing consumption and production patterns, as well as the opportunities for change, and proposes strategies to overcome the barriers.

Today, around 30% of the electricity generated in Israel is consumed by households and demand is rising with the increase in population and rising standards of living. Currently renewable sources provide only a small percent of the electricity supply. Reducing carbon emissions in Israel in order to mitigate dangerous climate change requires energy demand reduction because most of the energy consumed is generated from fossil fuels. Reducing energy demand is challenging and requires active and passive involvement of the public. Reducing household consumption is difficult, particularly where governments are reluctant to intervene in the citizen’s freedom of choice inside their own homes.

Most policy discussions concerning energy in general and electricity in particular focus on technology, costs of generation, capacity and energy consumption. Such parameters are indeed most relevant to electricity producers, the regulators and the technical administration for the energy sector but they are irrelevant to most consumers. From consumers’ point of view, be they households, businesses or governments, kWh or oil barrels are non-tangible and often invisible, meaningless units. What matters is not the source of energy but, rather, the services provided by it. Examples of energy services include heat for cooking, cooling for refrigeration,

illumination for houses, power for water pumping and power to allow mobility, accessibility and communication.

Energy efficiency is often seen as an easy goal to achieve through policy instruments. That is because efficient appliances provide the same level of service with less energy. In addition, efficient appliances already exist and economic instruments can be used to overcome barriers for their uptake through applying subsidies and incentives. However, research shows that part of the benefits gained through technological efficiency are lost by a concurrent increase in consumption of the same service or a different service so that the benefit gained in the end is considerably lower than the theoretical level anticipated. This effect is known as the ‘rebound effect’. Indeed, the ownership and use of electrical appliances in households and elsewhere is increasing and so is the demand for electricity. Additional policies are therefore necessary to reduce demand and increase sustainable sources of energy, beyond technological improvements and economic measures for energy efficiency.

This paper suggests that two essential elements for successful change are agency and capacity, where 'agency' refers to the ability of actors to make their own free choices and their willingness to do so, and 'capacity' refers to the abilities of actors to perform the choices they made. When levels of both agency and capacity are high, a change is more likely to occur. Accordingly, barriers to change can be conceptually divided into two types: those related to low levels of agency and those related to low levels of capacity. Improving efficiency is often regarded by decision makers as easy to achieve since it is assumed that consumers have high levels of agency and are interested in increased efficiency, and that the main barrier related to capacity is economic. It is assumed that the way to overcome the mismatch between agency and capacity is through reducing the price paid by the consumers – and increasing levels of capacity. However, focusing solely on the economic aspect overlooks the fact that consumption is not only based on an economic evaluation of costs and benefits but is also influenced by habits, norms, values and the lack of preferable alternatives.

Literature on change tends to divide changes into those which are induced from the top-down (such as regulation) and those which evolved from the bottom-up (such as local citizen activity). This paper proposes a different approach to change which is generated at the middle (or meso) level and spreads from the middle-out. It focuses on the actors who can initiate and promote change which influences the top (decision makers), the bottom (consumers) and other middle agents. Middle agents are neither the regulators, nor the producers or consumers, but agents which influence and design the ways by which energy is consumed. Such agents can influence both the agency and the capacity of other actors in a way which is not available to governments or to consumers.

Governments frequently fail to identify middle agents and therefore miss the opportunities they can offer. Moreover, middle agents can be the reason for the barriers to and failure of policy instruments. Examples for middle agents include architects and other building and planning professionals. Planners and builders design and produce the spaces within which energy services are consumed (lighting and heating/cooling) and their choice of design and the use of building materials can significantly affect energy use as well as the ability of the residents to generate renewable energy. As such, they influence the building users' levels of agency and capacity to save energy. Other middle agents influence levels of agency and capacity via their influence on aspects related to lifestyle and energy consumption norms. Due to their position relative to other actors, middle agents are often in a better position to influence change compared with top actors. For example, they can propose socially acceptable platforms that affect energy use, such as platforms for collaborative consumption, alternative sources of energy which are not dependent on the electricity grid and forms of community organization for reduced energy use.

This paper focuses on various middle actors in the urban environment who could be agents of change by promoting 'generation' of Negawatts and 'green' Megawatts. Particular emphasis is given to the potential roles of municipalities and local authorities. Municipalities are more familiar with the social characteristics and acceptable norms of their population

than governments and are better able to analyze aspects related to levels of agency and capacity, such as the geographic dispersion of consumers, demographic, economic, cultural and religious characteristics of their residents as well as recognizing possible constraints to action. Due to this familiarity with local characteristics, local authorities are also in a good position to match appropriate solutions and measures to each community or sector. As such, a municipality can influence in three directions in middle out manner: downstream - influence consumers within its boundaries; sideways - influence middle agents involved in planning and building, as well as other professions and other municipalities; and upstream - influence government, regulator and energy providers.