Cities for Climate Protection initiative in Israel
Assessing the impact of urban, economic, and socio-political factors on program implementation

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Introduction: Cities and climate change

The phrase "Think Globally, Act Locally" has long been an axiom of modern environmentalism. The role of local authorities in preventing environmental degradation and promoting sustainable development received formal international recognition at the 1992 UN Conference on the Environment in chapter 28 of Agenda 21. It stated: *"Because so many of the problems and solutions being addressed by Agenda 21 have their roots in local activities, the participation and co-operation of local authorities will be a determining factor in fulfilling its objectives"* (United Nations, 1992). In an attempt to translate this abstract concept into practice, hundreds of organizations, programs and plans around the world were initiated in order to promote sustainability among local authorities (Betsill and Bulkeley, 2006).

Many commentators (Besill and Bulkley, 2006; Bai, 2007) see local authorities, rather than national governments, as more suitable for addressing global environmental issues, such as climate change. This is so for various reasons: More than half of the world's population is now urban, and this ratio is expected to grow in the future (Cohen, 2005). In addition, cities are a focal point for high levels of resource consumption and waste production. Therefore, cities increasingly dominate the greenhouse gas (GHG) emissions associated with climate change (Bai, 2007). Some studies estimate that cities are responsible for approximately 78% of global CO_2 emissions (Betsill, 2000).

Betsill and Bulkley relate to opportunities and advantages of local authorities in achieving meaningful GHG reduction: Municipalities can directly affect emissions level by controlling energy supply, planning transportation and land uses, managing waste, setting building regulation, etc. Some of them also have experience in tackling environmental issues through promotion of local agenda 21 and other sustainability programs. Willbanks and Kates (1999) argue that "*… because city government is more closely linked to people's day-to-day lives, local officials may be more successful in promoting the behavioral changes necessary to abate the GHG emissions"*. In addition, local government can engage with the issue of climate change through cooperation with the public, relevant stakeholders, and by advocating for climate action at the national level (Betsill and Bulkley,2006).

Over the last two decades, and particularly as a result of the 1992 United Nations Framework Convention on Climate Change (UNFCCC) and the formulation of the Kyoto Protocol in 1997, the issue of climate protection and GHG mitigation has become a central element in local sustainability programs. A growing amount of municipalities have set their own reduction targets and local climate change agenda. These efforts were supported by the creation of sub-national city networks such as the Cities for Climate Protection Campaign (CCP) of the International Council for Local Environmental Initiatives (ICLEI). These have grown and diversified, and currently pursue campaigns in all continents, including the Global South (Betsill and Bulkeley, 2007).

Cities for Climate Protection Campaign (CCP)

In 1991 the International Council for Local Environmental Initiatives (ICLEI) launched the Urban CO2 Reduction project, which in 1993 developed into the Cities for Climate Protection Campaign. Its goal is: *"[to assist] cities to adopt policies and implement quantifiable measures to reduce local greenhouse gas emissions, improve air quality, and enhance urban livability and sustainability"* (ICLEI, 2009).

In order to become a CCP member, a city's council has to pass a formal resolution, declaring its goal of reducing greenhouse gas emissions and mitigating the effects of climate change. Members commit to a five "milestones" program aimed at reducing emissions (Betsill, 2001):

Conducting a GHG emissions inventory for the baseline year; selection of a reduction target; designing a climate change action plan; implementation of policy measures; and monitoring and verification of results.
In February 2008, eighteen of the largest cities in Israel joined ICLEI's Cities for Climate Protection Program, committing to reduce their GHG emissions to 20% below their level in the year 2000. It is not clear, that they have the capacity or the political will to affect significant changes and thus fulfill these new obligations.
The goal of this paper is to examine the opportunities and obstacles that influence the capacity of Israeli cities to adopt and implement local climate related policies. We will present a qualitative analysis of the applicability of various policy measures, previously or currently implemented by other CCP municipalities around the world. Specific policy actions were selected to demonstrate a variety of social, political and economic aspects that have some bearing on the capacity or incapacity of Israeli cities to act on the matter of climate change and GHG emission reduction.

Barriers to local mitigation of climate change
As mentioned before, cities play a central role in fossil fuel consumption and GHG production and therefore could directly contribute to global attempts to reduce emissions. However, the literature relates a variety of structural obstacles hindering cities from acting in this field. Betsill (2000; 2001) refers to several institutional barriers to local tackling of climate change:

- Climate change is framed as a global issue, and therefore many municipalities argue that it should be dealt with on the international and national levels of government. Hence climate change is not the concern of local authorities until determined otherwise by law. Changing the global climate change discourse and framing it as a local issue is critical for the success of local mitigation and adaptation programs such as Cities for Climate Protection (Betsill, 2001).
- Bureaucratic structure: The multidisciplinary, cross-cutting nature of the climate change issue does not correspond with the departmentalized structure of most municipalities. Climate change policy requires coordination between different departments (e.g. waste and water management, transportation planning, land use planning, electricity, etc.). In an attempt to solve this problem, various cities have established a municipal office aimed at coordinating between relevant departments (e.g. Sustainable Development Office in the city of Portland).
- Administrative capacity: management and coordination of a GHG reduction policy requires investment of resources such as time and personnel. Betsill (2001) argues that most US cities are neither able nor willing create a position dedicated to climate change, partly because other issues on the city's agenda are considered to be more significant.
- Budgetary constraints: In many cities environmental programs might be considered as "luxury" expenses, and therefore are at a greater risk of being cancelled due to budgetary cuts. Moreover, GHG reduction often requires large initial investments on the basis of predicted environmental and economic benefits in the future. Short term planning common among city budget officials prevents municipalities from making long term investments on the premises of unknown economic efficiency (Betsill, 2001). Research done in 23 CCP cities in the US shows that cities tend to adopt reduction measures with payback times of approximately 5 years. This type of budgetary policy prohibits cities from investing in meaningful reduction measures, such as alternative energy, public transportation development and green building. Only few cities are willing to consider longer payback periods (e.g. Portland invested in any energy efficiency measures with a payback period of 10 years or less). (Kousky and Schneider, 2003).

Local climate action: does the CCP program lead to a meaningful reduction of GHG emissions?
Local governments have to a certain extent, the power to influence the amounts of energy used and waste produced within their jurisdiction. By controlling aspects of physical planning and provision of services, municipalities can affect the level of use in public and alternative

transportation (and consequently lower the dependence in private automobiles), decrease the need for artificial climate control measures in buildings and reduce the amount of waste thrown in landfills (ICLEI, 2000)[1].
In the last 15 years, hundreds of extensive local climate action plans were written and partially implemented. The majority of these documents are characterized by ambitious emission reduction goals and an "all included" policy design. That is to say many of the action plans set targets and tactics for various aspects of local climate change policy: transportation and land use planning, waste treatment, energy conservation and production, etc.
Most cities that have set a GHG reduction target in the United States have adopted the Kyoto Protocol goal for the US- 7% below 1990 level. In the last several years, many cities have also assumed ambitious long term reduction goals (e.g. some US cities committed to an 80% reduction target below 2000 level, by the year 2050 (Wheeler, 2008); The city of Stockholm, Sweden has set out to be a "fossil fuel free city by 2050" (ICLEI, 2005). Wheeler (2007) argues that dramatic abatement targets come at the expense of near-term targets, and therefore create an impression of local climate action without implementation of meaningful policy measures.
Very few cities have prepared a progress report indicating amounts of GHG abated, hereby making it difficult to observe advancement of the CCP program (Wheeler, 2007).
Nevertheless, various reports and studies show that most of the GHG reduction reported by cities is a result of executing easy to implement, one-time effort policy measures ("picking the low hanging fruit") (Aall, Groven and Lindseth, 2007). Also, it seems that many municipalities attain GHG reduction at no cost and often manage to produce financial saving. However they rarely pursue extensive reduction measures at high cost (Kousky and Schneider, 2003).
An analysis of British and Welsh local climate action shows that little progress has been made in both climate change mitigation and adaptation. Most municipalities have shown progress in single issue areas, such as increasing use of renewable energy. However, most of these local authorities have failed to achieve meaningful reduction by implementing a comprehensive multidisciplinary strategic plan (Allman, Fleming and Wallace, 2004).
Examination of data from the USA shows that 2005 emission levels for the country as a whole were 16.3% higher than in 1990. GHG emissions are also rising at individual state levels. Partial progress has been made in some municipalities, however actual reduction levels are far lower than the declared goals. For example: Emission levels in the City of Denver rose by 24% while the city's population grew at the same rate; Portland reports a minimal rise in emissions between 1990-2004, whereas emissions per capita decreased by 12.5%. Los Angeles declares a meaningful reduction of 4% between 1990 and 2004, despite population growth of over 400,000 people. Seattle also demonstrates a substantial 8% reduction between 1990-2005. On the other hand, the city of Cambridge, MA estimates a 23% increase in emissions between 1990 and 2010 (Wheeler, 2007).

Climate protection policy in Israel:
The Kyoto Protocol of the UNFCCC was adopted in 1997. It contains legally binding targets for industrialized countries to reduce greenhouse gas emissions by an average of 5% relative to 1990 levels over a period of five years: 2008-2012. The protocol came into force in February 2005 and has thus far been ratified by 184 countries (UNFCCC, 2009)[2].
Mostly due to its small size and population, the amount of greenhouse gases emitted by Israel is almost negligible on the global scale (i.e. Israel's emissions in 2004 amounted to 73 million tones compared to Germany's 1 billion tones). However, Israel's emissions' per capita are similar to those of other developed countries (Goldshmidt, 2007). Despite this fact, in the framework of the Kyoto Protocol, Israel is considered to be a developing country; hence it is not obligated to any specific emissions reduction targets.

[1] ICLEI, 2000. Best Practices for Climate Protection. A Local Government Guide
[2] UNFCCC, 2009. Kyoto Protocol, http://unfccc.int/kyoto_protocol/items/2830.php

Israel has ratified the Kyoto Protocol in February 2004, but did so without committing to any quantitative reduction targets. Since then, very few measures were taken to promote a national climate protection policy (Paths to Sustainability, 2008).
It is estimated that in the post-Kyoto agreement to be signed in the Copenhagen convention in December 2009, Israel would be considered a developed country, and therefore be required to commit to a significant GHG reduction target and implement a comprehensive climate protection policy (Paths to Sustainability, 2009).
In Israel, in resemblance to other countries, when a "progressive" climate policy was not upheld by national government, an attempt was made by sub-national governments/groups to fill the "policy void".
In February 2008, eighteen of the largest cities in Israel have entered a commitment to mitigate their GHG emissions by the year 2020 to a level that is at least 20% lower than the emissions level of the year 2000. By doing so, these cities have joined the International Council for Local Environmental Initiative (ICLEI) Cities for Climate Protection Campaign. This treaty was a joint initiative of both the Local Sustainability Center and the Forum of the 15 Independent Cities. The Local Sustainability Center is an NGO *"founded in order to advance the capacity for sustainability in Israeli local government"* (Local Sustainability Center, 2009). The Forum of the 15 Independent Cities is an alliance of municipalities that are not financially dependent on development funds from the central government, and therefore are able to maintain themselves as a closed economy operating on its own financial resources (Forum of the 15 Cities, 2009).
The forum represents most of the large cities in Israel, as well as most of the metropolitan areas in the country. Approximately 40% of Israel's population (3 million people) resides in these cities. In addition, 70-80% of population commutes to and from these cities, and relies on their services (Ibid). Furthermore, three other cities have voluntarily joined the CCP project; among them the City of Jerusalem which is the largest in Israel with approximately 750,000 inhabitants (Central Bureau of Statistics, 2007)
Most these cities are currently at the initial stage of the project: preparing an inventory of the GHG emissions for the year 2000 (the baseline year), and therefore, have not yet set specific abatement targets nor adopted a local action plan and GHG mitigation policy.
Seemingly, this group of the "strongest" cities in Israel has the largest potential of successfully implementing significant climate related policy measures. However, this research shows that in the context of the local arena in Israel and its dependence on the central government, along with relatively low political and public support to implementing substantial climate related policies the potential efficacy of the CCP program in Israeli cities is quite limited.

Research Question and Methods

The goal of this research is to examine the opportunities and obstacles that influence the capacity of Israeli cities to adopt and implement local climate related policies. In this paper we will address the following two questions: one, do Israeli cities possess the necessary capabilities and authority to abate GHG emissions in their jurisdiction? And two: how do various social, economic, spatial and political factors (such as size, interdependency within a metropolitan region, limited budget, lack of authority over planning and infrastructure provision) affect cities' ability to reduce GHG emissions?
This work is based on a review and qualitative analysis of best practices of GHG reduction measures in worldwide cities, and an evaluation of their applicability in Israel. Since the CCP program in Israel is in its initial stages (officially started in February 2008), the study mainly refers to future local action plans and examines how relevant social and political actors perceive the applicability and potential of different policy measures.
The analysis is based on in-depth interviews with decision makers and professionals in local municipalities and central government, program officials and NGOs. Interviews were conducted in four cities of different typologies (the cities of Jerusalem, Be'er Sheva, Ra'anana, and Ashdod). In each city a minimum of two in-depth interviews was carried out with both political and professional figures. Interviews have focused on several themes: goals

and the reasons for participation in the CCP program; factors limiting/enabling policy implementation; the position of the climate change agenda in the city's vision and the implementation potential of various policy measures.
Additionally, a questionnaire was given to representatives of all eighteen cities participating in the program, aimed at examining decision makers' perceptions regarding the implementation potential of different policy measures and which social, political, geographical and economic factors influence the feasibility of implementation. Interviewees were asked to rate the perceived applicability of ten policy measures in diverse fields and typologies on a scale of one to five. Furthermore, using an open question, they were requested to note up to three factors that influence implementation potential. Results were collected by phone interviews.
The best practice review presented in this paper (table 1) is based upon approximately twenty action plans of cities from around the world. Based on the interviews and questionnaires previously mentioned, in addition to document analysis and review of national and local legislation, five groups of enabling/hindering factors were identified: political authority and responsibility; budgetary barriers or opportunities; time scale; political will and public support. Every factor was then considered as having a positive (marked as '+'), negative ('-') neutral ('0') or unknown (?) influence on the implementation of each of the policy measures in the local arena of municipalities in Israel. Several policy measures were then chosen as case studies to demonstrate the manner in which different factors affect implementation potential.

The relationship between central and local government
One of the main goals of any democratic society is to ensure an appropriate use of ruling power to promote joint social objectives. The principle of "separation of powers" is a central tool used by democracies to prevent arbitrary use of power.
The division of power is manifested through two types of "checks and balances" systems: horizontal checks and balances between three branches of governmental authority (executive, legislative and judicial) and vertical division of powers between national and sub-national levels of government (Rubinstein, 2004).
The relations between central and local government in various countries range between absolute dependency of local government in the central government on the one hand, and absolute independence on the other hand. (Tabibian-Mizrachi, 2003).

Local government in Israel
The relations between central and local government in Israel are based on the legal principle of *ultra vires*, which concludes that local governments engage only in the specific fields they are statutorily responsible for (Ben-Eliah, 1995; Bulkley and Kern, 2006).
The main fields put under the responsibility of the local government in Israel are: engineering (paving local streets, roads and pavements), urban planning, waste and sewage treatment, sanitation and water supply. However, the municipalities' authority in those fields is not complete and in many respects it is subjected to central government's supervision through its regional offices. For example: local planning committees are responsible for setting urban policy and land-use planning of urban settlements, through the design of local master and detailed plans. Local master plans should observe the planning principles and standards as well as regional and national plans set by national and regional planning committees and to have their plans approved by these committees.
Local government in Israel has limited authority of enforcement and policing, land use planning, planning and construction of public housing and public institutions (Razin, 2003). For these reasons various commentators argue that the decision making, planning and executive systems in Israel are relatively centralized in comparison to other Western countries. The Ministry of Interior holds direct authority over local municipalities, but the latter also remain under the supervision of different government ministries, each in their own field (E.g. transportation, welfare, education, etc.) (Razin, 2003; Ben-Eliah, 1995).

Since the 1970s many countries have gone through a process of political and economic decentralization, manifested in the empowerment of sub-national governmental levels, particularly- local government. This development was a result of both an ideological trend towards liberalism and moderation of power of central government, and also a process of democratization of the decision making process. Moreover, due to declining resources, and deteriorating capacity of central government to appropriately manage the public system, local governments officially took upon themselves additional social, economic and urban tasks (Ben-Eliah, 1995).
In Israel, this trend of decentralization and liberalization became predominant in the 1980s and 1990s, when local government has expanded and varied its fields of action, due to the central government's inability to uphold all its duties, as well as closely supervise local government. This process created an anomaly in which official legislation reflects a high level of centralization, whereas in actual fact, due to the functional failure of central government, local government has assumed additional responsibilities, particularly in the fields of physical and economic development and social services. Nevertheless, despite this "de facto" process of delegation of responsibilities, the extremely centralized legislative foundation has a substantial effect on central-local government relations in Israel. Local government is required to get central government's confirmation every step of the way (e.g. approval of local budget, by-laws, planning, etc.). On the other hand, central government's allocation of funds is not established in legislation, and therefore central government has leverage over local government, creating a relationship based on dependence (Razin, 2003).

Discussion:
This section presents an analysis of the factors enabling or limiting implementation of GHG reduction measures in the context of Israeli cities. Table 1 portrays a summary of best practices of local GHG abatement measures, representing different strategies and governance mechanisms. This review is based upon approximately twenty action plans of cities around the world.
Bulkley and Kern (2006) have identified four modes of governing climate protection at the local level: ***(1) Self governing***: refers to the ability of local government to manage its own actions and activities. Its success depends on organizational skills and management of internal processes; ***(2) Governing by provision****:* Local government carries out policy by controlling the provision of services and allocation of resources in the city; ***(3) Governing by authority****:* Utilizes traditional forms of authority such as regulation, sanctions and planning; and ***(4)Governing through enabling****:* refers to local government's role in facilitating action through persuasion, education and provision of incentives. Local government plays the role of the "coordinator between private sector, citizens and NGOs." [The numbers that appear in parentheses in table 1 represent the mode of governing utilized for implementing the policy]. Clearly, each GHG reduction strategy can be accomplished by more than one mode. For example: encouragement of the public to use alternative modes of transport instead of private vehicles could be accomplished in several ways: providing public transportation services, limiting the entrance of cars to city center, launching an educational campaign encouraging the use of bicycle as means of mobility, or providing city workers with bus vouchers rather than parking permits.
A study of local climate related policy actions in England and Germany shows that the majority of actions chosen are in the self governing mode, and in the energy sector (Bulkley and Kern, 2006).
Analysis of the policy measures shows that the majority of actions that have the most positive potential for implementation in Israeli cities, are concentrated in the governing through enabling mode. For example: public campaigns to encourage recycling or the use of alternative transportation, green building training courses, etc. Aall, Groven and Lindseth (2007) refer to these kinds of actions as "symbolic climate policy", characterized by execution of 'soft' policy measures such as distribution of information. These measures often generate a sense of action, but in actual fact have a limited potential of contributing to climate protection.

On the other hand, a different form of enabling policy involves offering citizens various incentives in order to foster behavioral change. This often requires high involvement of both local and national government, since large-scale incentives and subsidies programs call for large-scale funding. Our analysis shows that local incentive programs have higher implementation potential when the incentive is not a proper monetary subsidy (e.g. scrapping programs of old cars or inefficient air conditioners), but rather other benefits that the municipality can provide. For example, the city of Ra'anana in Israel is planning to introduce a "fast track" in the local planning committee for any resident who wishes to put PV solar panels on their rooftops (Bosso, 2008).

A nation-wide or a city-wide electric appliances replacement program could potentially have a significant bearing on energy conservation. One third of electricity consumption in Israel originates from households. An extensive national replacement program could lead to an average of 30% energy conservation (Becker and Azaria, 2006). Although local government is frequently considered as having a more direct impact on individual behavior (e.g. energy consumption in households), our findings show that municipalities in Israel often abstain from "intervening" with the "private choices" made by people regarding their energy consumption. Many local decision makers do not perceive the municipality as responsible for the amount of energy consumed by its citizens. One of the interviewees went as far as suggesting that a local initiative to replace inefficient electric appliances would be an illegal act, since public money is designated only to benefit a private individual (Hartom, 2009).

Most of the national climate policy plans emphasize the supply side of the energy market, by offering alternatives to fossil fuel based power production. Electricity production in Israel is a highly centralized process, where policy is set by the Ministry of National Infrastructure and executed by a single electric company. Only in July 2008 the market has been officially opened to small-scale private electricity manufacturers (Ministry of National Infrastructure, 2008). Local government has hardly any say on the matter of national energy policy, even if it has profound environmental effects within a city's jurisdiction. For example: in the last several years the environmental movement in Israel has fought against the government's decision to construct a coal based power station near the city of Ashkelon. Although the forum of the 15 independent cities, among them the city of Ashkelon have officially expressed their objection to the resolution, their capacity to influence the policy is mostly symbolic and resembles the capabilities and tactics of non-governmental organizations (NGOs).

On the other hand, local governments in Israel can have considerable effect on energy consumption and to some extent, energy production in their own operations. For that reason we can find a variety of examples of energy related actions that are performed in the self governing mode. For example: the city of Tel Aviv is planning to build a solar farm on the municipality's roof (Shapira, 2006); the city of Modi'in has leased the rooftops of schools to solar power operating companies. Half the rent profits are designated for environmental education programs in the schools (Shapira, 2008). Clearly, these kinds of actions are not only measured by the actual emission reduction they produce, but also by the "good example" the municipality sets for its citizens and the behavioral change it encourages.

Although municipalities have the authority and the sense of responsibility to control their own energy both for financial and environmental reasons, there are a number of constraints limiting their capacity for action. For instance, Installation of alternative energy measures such as photovoltaic panels is characterized by high costs and long return on investment periods (approximately 15 years). This requires municipalities to issue long term tenders and face different bureaucratic obstacles. Additionally, local leadership is sometimes reluctant to carry out such long-term actions, as the positive results of the policy will not be evident during the mayor's five years term (Sagi, 2009).

Bearing in mind that the amount of GHG emissions that originates from the municipality's operations accounts for roughly 2-4% of total city emissions, we can conclude that the actual reduction potential entailed in the installation of photovoltaic panels on public buildings' rooftops is not substantial (Sagi, 2009).

Table 1: Analysis of Opportunities and Barriers to Implementation of Policy Measures in Israel

Policy measure	authority	budget	time	Political will	Public support
Transportation and urban planning					
Limit entrance of cars to city center **(3)**	+	-	0	-	-
Construction of electric car recharge areas **(2)**	?	-	-	+	+
Supply incentives for "clean" car conversion. **(4)**	-	-	0	0	0
Allocation of carpool parking permits **(4)**	?	+	+	0	0
Adding miles of High Occupancy Vehicle Lanes **(3)**	-	0	0	-	-
Operating city car sharing program **(2)**	+	+	0	+	+
carpool website **(4)**	+	+	+	+	+
Providing businesses with information regarding alternative to fleet vehicles. **(4)**	+	+	+	0	0
Introduce parents with a formal carpool program to schools/walk to school project. **(4)**	+	-	0	0	+
Reduce number of take-home cars for employees **(1)**	+	+	0	-	-
Developing work from home facilities **(1)**	+	+	0	-	-
Reduction of parking ratios in the city and increasing parking prices **(3)**	+	+	-	-	-
Reduction of traffic volume by applying road pricing **(3)**	+	+	-	-	-
Insurance pricing per VKT **(3)**	-	0	0	0	?
Increase gas tax **(3)**	--	0	0	?	-
Development of PT systems (Tram, BRT, rail, bus network) **(3)**	+	-	-	?	+
Improve PT service **(3)**	+	-		+	+
Improve comfort of bus users by renovating shelters and signing. **(2)**	+	-	0	+	+
Synchronizing traffic signal timing to improve transit flow and reliability **(3)**	-	0	0	-?	-?
Providing "smart cards" for use of all modes of transit in city. (3)	-	0	0	+	+
Operating a free transit service around city center. **(2)**	?	-	-	?+	+
Provide city workers with transit vouchers instead of car use funding **(1)**	+	+	0	?	?-
Encourage shop owners to provide shoppers with transit vouchers rather than parking permits. **(4)**	?	-	0	-	-
Smart Commute Mortgage program- incentives for residents to purchase homes near public transport **(4)**	-	0	0	?	0
Increase awareness of public transit through awareness campaigns **(4)**	+	+	0	+	+
Developing PT hubs containing different modes of PT **(3)**	+	-	0	+	+
Conversion of transit fleet to low emission vehicles **(3)**	+	0	0	?	+
Development of bicycle lanes network **(3)**	+	?-	0	+	+?
Providing "end of trip" infrastructure for bikers. **(2)**	+	0	0	+	+
Increase bike parking requirements for neighborhoods and business districts. **(3)**	+	0	0	+	+
Establish a bike sharing program. **(2)**	+	+?	-	+	+
Development of an urban walking trails system **(3)**	+	-	0	+	+
Supplying information on alternative modes of transportation **(4)**	+	0	0	+	+
Provide employers with information about trip reduction strategies available **(4)**	+	+	0	+	+
Recruit Travel Coordinators to develop a Travel Planning program for individuals, schools, businesses **(2)**	?	-	0	?	+
Integrated land use and transport planning ("transit oriented development) **(3)**	+	-	-	?	?
Energy					
Adopting LEED/BRE standards in City buildings **(3)**	+	-	-	?-	+
******* (1) self governing (2) governing by provision (3) governing by authority (4) governing through enabling***					

Policy measure	authority	budget	time	Political will	Public support
Rewarding projects that receive LEED certification. **(4)**	+	+	0	+	+
Green Building training course for builders/architects/ /community **(4)**	+	-	0	+	+
Energy audits in city facilities. **(2)**	+	+	0	+	+
Encourage energy audits in private buildings **(4)**	+	+	0	+	+
Replacement of heating and cooling systems in city buildings **(4)**	+	-	-	?-	0
Changing lighting systems into energy saving lighting **(1)**	+	+	?-	+	+
Installation of solar water heaters on public buildings **(1)**	+	+	-	+	+
Installation of solar energy systems on City facilities **(1)**	+	+?	-	+	+
Changing traffic signals to LED. **(1)**	+	?+	+	+	+
energy conservation campaign among city employees **(4)**	+	+	+	+	+
Energy efficiency report is presented as part of the city budget. **(1)**	+	+	+	+	+
Install renewable energy power supplies for street lighting, traffic lights and bus stops. **(1)**	+	-	?-	?+	+
Designing peak load management and demand response programs for City departments. **(1)**	+	+	0	+	+
Integrate energy efficient equipment into city purchasing contracts **(1)**	+	-	0	+?	+?
Weatherization of dwelling units **(2)**	-	-	-	-?	?
Operating energy advisory service regarding energy efficiency and renewable energy **(4)**	+	-	0	-?	+
Replacement of incandescent lighting campaign **(4)**	+	+	+	+?	+
Incandescent lighting rebate program **(4)**	-	-	0	-?	+
Subsidizing higher efficiency heating/cooling equipment in buildings. **(4)**	-	-	0	-	+
Providing a CO2 calculator and recommending reduction and off-set strategies. **(4)**	+	+	0	+	+
Provide developers with information on green roofs or high reflectance roofs on buildings **(4)**	+	+	+	+	+
Designing energy management services to large energy users in the city **(2)**	-?	-?	0	+?	+
help householders to make use of small scale renewable technology **(4)**	+	+	0	?	+
Applying an energy efficiency rating of buildings**. (3)**	-	0	0	?	+
Increase electricity tariff **(3)**	--	0	0	-	-
Implement a City purchasing policy favoring Energy Star products **(1)**	+	?	0	+	+
Photovoltaic energy- compulsory in new public buildings **(3)**	+	-	-	-?	-?
Create a network of Green Power purchasing with other local governments **(3)**	?	?	?	?	+
Aggregate city residents into a power purchasing pool to offer an affordable green power rate **(4)**	-	0	0	+	+
Downtown zoning laws that allow increased height limits in exchange for inclusion of green building practices and funding affordable housing. **(3)**	?+	?	?	+	+
Waste and recycling					
Curbside recycling according to a multi- stream waste collection program **(2)**	+	+	-	+	+
Public campaign to encourage recycling **(4)**	+	+	0	+	+
Diversion of sludge from sewage treatment from landfills to agricultural uses **(3)**	?	?	?	?	?
Awarding businesses that reduce waste production **(4)**	+	+	0	+	+
Each department of city government designates a staff member responsible for resource conservation **(1)**	+	+	0	+	+
Each department submits an annual departmental waste assessment and action plan. **(1)**	+	+	0	+	+
Setting and maintaining a canopy cover ratio **(3)**	+	-	0	+	+
******* (1) self governing (2) governing by provision (3) governing by authority (4) governing through enabling***					

These findings show that the local government in Israel has limited capacity in instigating a substantial reduction of GHG emissions in the field of energy, neither on the supply side (electricity production) nor on aspects of energy demand management.
If successfully implemented, policy measures accomplished through the "governing by authority" mode can potentially bring about meaningful structural changes essential for achieving extensive emissions reduction. These include the relevant aspects of urban planning, such as intensification of urban form, transit oriented urban development, creating guidelines for energy efficient building in different sectors, and enforcing them through the building permit system, road pricing, etc. In addition, this mode of governance also includes operative policy measures such as: establishment of recycling sites, collection of Methane from urban landfills, planning and construction of walking and cycling infrastructure, etc (Bulkley and Kern, 2006).
In the context of Israeli local government, these types of policies might present the greatest challenge for implementation. As previously mentioned, the decision making, planning and executive systems in Israel are relatively centralized in comparison to other Western countries. In the matters of planning and construction of large scale projects, cities are obligated to get the approval (and partially the funding) from relevant ministries of central government (e.g. transportation, interior, etc.) (Razin, 2003).
Our findings show that local decision makers define the lack of authority to independently advance large scale projects - such as planning an urban public transportation system - as one of the greatest barriers to a meaningful abatement of GHG. When the organizers of the CCP project in Israel had designed a training program for local decision makers and professionals, the issue of transportation was prioritized last. This is despite the fact that transportation related GHG emissions account for 25-35% of cities' emissions. They maintain that before training cities' representatives regarding sustainable transportation, they need to make sure that cities can make any difference in the matter (Sagi, 2009;).
Lack of operative authority is not the only obstacle municipalities face when designing transportation related policy. Planning and development of an urban bicycle lanes network are policy measures that are, in actual fact, in the hands of the local authority. The ministry of transportation encourages municipalities to prepare Bicycle Master Plans, and offers assistance in funding. The difficulties of developing cycling lanes are predominantly the result of the fact that bicycles were not considered in the original urban planning. Introducing them into an existing street network entails depriving other users' right of way (cars, pedestrians, public transport, etc). This could present a political problem and generate public objections. The quality of a network of bicycle lanes is measured by its level of connectivity: between various cycling paths within the city; between cycling paths and other modes of public transportation; and between cycling paths in neighboring cities (Tal, 2007).
The city of Tel Aviv, for example, has a relatively developed cycling lanes network, as 80-100 km of lanes are already paved, and more than 200 additional km are being planned. Initially all lanes were paved as part of pedestrians' paths and on boulevards (Tal, 2007). In the last several years the city has constructed cycling paths also at the expense of car lanes or parking spaces. This shift has sometimes created public protest from citizens at the neighboring areas (Avizohar, 2009; Ziton, 2009). In addition, a large portion of the cities in the Tel Aviv metropolitan area are each planning bicycle lane networks in an individual manner. Every city is progressing at a different pace and constructing lanes of different characteristics. Hence metropolitan considerations are not being addressed (Avizohar, 2009).
An additional barrier for cycling to become an appropriate alternative for vehicle use, is the lack of connectivity to other means of public transportation. Currently, bicycles are not allowed on trains and bike carriers are not installed on public buses. This obstacle cannot be tackled by individual municipalities, and therefore needs to be handled at the national level by the ministry of transportation.
In 2008 the Israeli parliament has legislated a directive enabling cities to prepare a local transportation plan specifically aimed at abating air pollution in the city center. The plan should prioritize the movement of public transportation and encourage use of clean vehicles.

This directive had also given municipalities the authority to limit the movement of motorized vehicles in certain areas of the city (Ronen, 2008). To a certain extent this new directive has eliminated some of main barriers municipalities were facing in tackling issues of transportation. However, aside from the lack of formal authority in the field of transportation, other factors inhibit cities' capacity to take the necessary actions to promote sustainable transportation and urban planning. The approach prioritizing movement of private vehicles rather than giving precedence to alternative modes of transportation is still quite predominant among local professionals. In addition, in order for public transportation and cycling to be a genuine alternative to the use of the private automobile, planning should also be done at the metropolitan level, rather than at the city level. Establishing a metropolitan transportation authority is considered by many (Ministry of transportation, 2007) to be a solution for the lack of cooperation between municipalities in transportation planning, waste and water management, etc. The enormous budget required for implementation of large-scale transportation projects, along with political and public objection to "unpopular" steps (e.g. reduction of parking ratios or applying road pricing) also pose a substantial barrier for implementing policy measures relevant for GHG reduction at the local level.

Conclusions:

In 2008, eighteen of the largest cities in Israel joined the Cities for Climate Protection Program, committing to reducing their GHG emissions to 20% below levels in the year 2000. The goal of this study was to examine the opportunities and obstacles that influence the capacity of Israeli cities to adopt and implement local climate related policies.

This paper mostly focused on Israeli cities' potential for action in the fields of energy and transportation. Emissions inventories performed by the cities as part of the CCP program show that both these fields account for 80-90% of GHG emissions in them.

Our findings show that the local government in Israel has limited capacity in instigating a substantial reduction of GHG emissions in the field of energy, neither on the supply side (electricity production) nor on aspects of energy demand management. Electricity production is an extremely centralized practice in Israel, operated mainly by one Electric Company, and only opened to small scale producers in 2008. This new legislation enables local authorities to both produce clean energy for the municipality's operations, as well as encourage their residents to produce "green power" for their own use. In addition, we found that municipalities in Israel often abstain from "intervening" in the "private choices" made by people regarding their energy consumption. We argue that in order for a municipality to meet its GHG reduction target it must manage the demand for energy among all sectors in its jurisdiction, by applying different modes of policy making. This includes educational campaigns, adoption of a green building code, weatherization of existing housing, designing energy management services to large energy users, applying an energy conservation program within the municipality, etc.

With respect to transportation, we found that local governments' ability to act is limited by a variety of factors, such as lack of authority to plan and implement local transportation projects; budgetary constraints; predominant planning approach that prioritize the private automobile rather than alternative modes of mobility; the lack of cooperation between municipalities in the same metropolitan area; and political and public objection to "unpopular" steps (e.g. reduction of parking ratios or applying road pricing).

The analysis of the policy measures shows that the majority of actions that have the most positive potential for implementation in Israeli cities, are concentrated in the governing through enabling mode. For example: public campaigns to encourage recycling. These partially symbolic measures are relatively easy to implement, but their actual contribution to climate mitigation is uncertain.

In order to achieve a meaningful GHG reduction rate, municipalities in Israel should create an urban environment that enables "climate friendly" behavior. Local government should focus on developing economic tools that foster a behavioral change, along with providing their citizens the necessary services and physical infrastructure.

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