



# Chicago Metropolitan Agency for Planning

233 South Wacker Drive  
Suite 800  
Chicago, IL 60606

312-454-0400 (voice)  
312-454-0411 (fax)  
[www.cmap.illinois.gov](http://www.cmap.illinois.gov)

## MEMORANDUM

**To:** CMAP Board

**Date:** February 3, 2010

**From:** Hala Ahmed

**Re:** *GO TO 2040* Policy Briefing: Resource Conservation

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From fall 2009 to spring 2010, CMAP staff will brief the Board on key policy areas that are recommended to be among the priorities of *GO TO 2040*. At the February meeting, one of the key policy issues discussed will be **resource conservation**, including both water and energy. It is expected that the *GO TO 2040* plan will recommend conservation measures to reduce the region's consumption of these natural resources.

### *Summary*

Historically, the northeastern Illinois region's proximity to abundant supplies of freshwater and access to energy sources have had a tremendous impact on growth and prosperity. As the third largest U.S. metropolitan area and as a place of global significance, metropolitan Chicago is a very desirable place to live and work, and play. Due to projected growth, conserving these resources will be critical to the region's environmental and economic sustainability. Thus it is imperative to employ strategies that increase efficiency of resource usage and ensure security and sustainability of resources.

Efficiency in the use of resources such as energy and water has many positive implications for a growing region such as northeastern Illinois. Improved conservation will support growth and development (which are dependent on abundant supplies of energy and water), preservation of natural resources, and maintenance of aquatic ecosystems and biodiversity. Energy use is entwined with numerous activities and directly influences greenhouse gas emissions, air quality, and the costs of consumption and production. From the water resources perspective, the region cannot assume that fresh water supplies are infinite. Especially in light of projected population growth, increased conservation and improved resource management will be key to averting potential shortages through 2050.

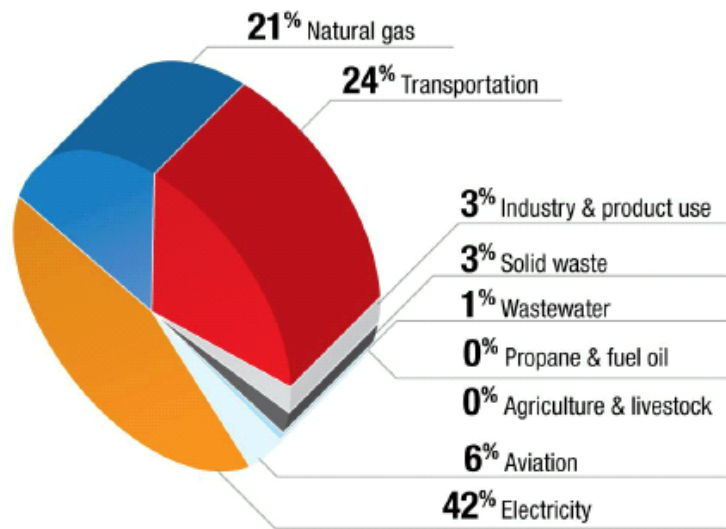
Of specific interest is the connection between resource consumption, air quality, and climate change. The negative impacts of greenhouse gas emissions on air quality and water supply

have led to significant resource conservation initiatives globally, nationally, and locally (e.g., the Chicago Climate Action Plan). The region is a major consumer of resources and emitter of greenhouse gases, which presents challenges and opportunities for new innovative initiatives. The ongoing national debate on climate and energy policy and possible emerging federal legislation will have dramatic impacts on the region's economy. This necessitates proactive measures so that northeastern Illinois is positioned to adapt to a new regulatory environment and to benefit from emerging federal programs targeted at this topic.

*Importance of resource conservation*

Reducing the region's energy consumption is the main element of any regional response to climate change. The Regional Vision states that the region should be a leader in green building techniques, in the production of green energy, and in providing transportation options. Additionally, during the "Invent the Future" public engagement activities, participants identified energy reduction as an important evaluation measure to assess the health of the region. As shown in the chart below, technical analysis conducted for CMAP by the Center for Neighborhood Technology found that energy use in buildings – electricity and natural gas – is the region's primary source of greenhouse gas emissions accounting for 63 percent of all emissions in the region, followed by the transportation sector with 24 percent. (Regionally in 2005, these emissions totaled 139.8 million metric tons of carbon-dioxide equivalent, or MMT CO<sub>2</sub>e.) Thus, when considering strategies to reduce our carbon footprint, it makes sense to focus on buildings and transportation. Energy conservation is an element in most, if not all strategies that the plan will address, ranging from mixed-use reinvestment to the provision of a balanced supply of housing and jobs.

**2005 CMAP emissions profile including aviation,**  
total MMT CO<sub>2</sub>e: 139.8

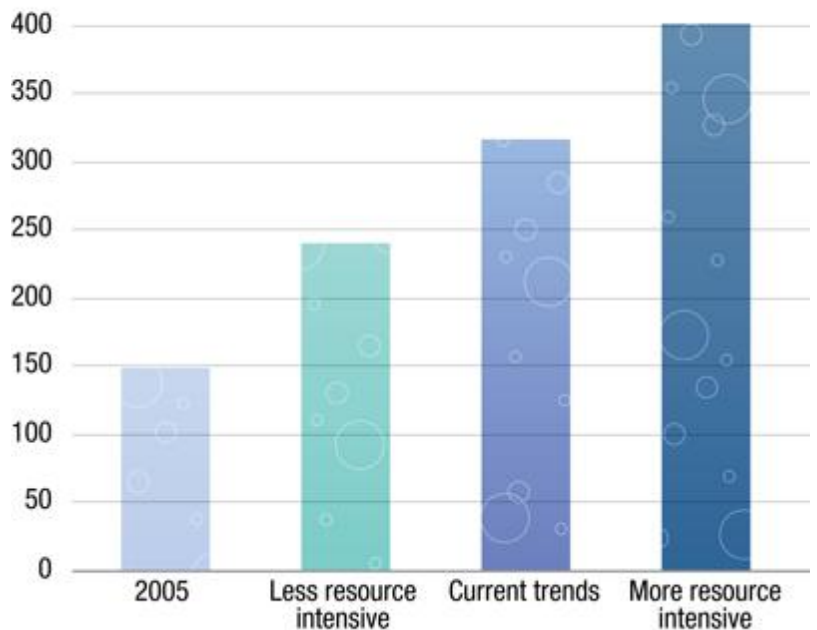


Source: Center for Neighborhood Technology

The Regional Vision also articulates the importance for the region to be known for its high quality of water, and states that planning for water resources must be a high regional priority. The Regional Water Supply Planning Group (RWSPG), with staffing and coordination by CMAP, completed three years of studying water supply and demand by releasing its final report on January 26. The Northeastern Illinois Regional Water Supply/Demand Plan states that as the population increases by 38 percent through 2050, water demand could increase between 36 percent and 64 percent compared to 2005 if current trends continue. Groundwater

modeling shows that, without conservation, growing demand may result in increased drawdowns (lowering of the water table) in the shallow-bedrock aquifer. In turn, this appears to lead to reduced baseflow in surface waters (as wells continue to withdraw, water will be diverted from the nearest river or stream in an effect called stream capture). In contrast, implementing a number of water-use conservation measures would result in a less-resource intensive scenario that mitigates the increase in water demand. Further analysis reveals that density and land use patterns have a direct effect on water use and investments in water infrastructure. Water supply has become an increasing concern in many parts of the region, and a number of local governments have initiated water studies to gain a better understanding of the issue and potential solutions.

**Public Supply, Groundwater Withdrawals:  
2005 vs. 2050 Scenarios, in millions of gallons per day**



Source: Dziegielewski and Chowdhury, 2008

#### *Recommended direction for GO TO 2040*

GO TO 2040 should support efforts to conserve energy and water, recognizing the strong link between consumption of energy and water. The U.S. Environmental Protection Agency has developed a Sustainable Water Infrastructure Initiative that, among other activities, aims to improve energy efficiency at water utilities across the country. When demand for water is reduced, water utilities may achieve energy savings due to reductions in water pumping, treatment, and conveyance. At the same time, reductions in water use result in less sewage that must be transported to wastewater treatment plants, which in turn may save energy required for treatment and conveyance. Much as water production requires energy, the reverse is also true: Energy production requires significant amounts of water. For the region to retain its global competitiveness, actions must be taken at the local and regional levels to ensure sustainable energy and water supplies for continued economic prosperity, environmental quality, and social equity.

The overall goal of this recommendation is to reduce resource consumption but also allow continued, long-term sustainable growth. Resource conservation actions can take the form of **retrofits** to existing buildings or infrastructure, or **ordinances and codes** that guide new development. GO TO 2040 should recommend that these actions be taken at the local level to accomplish overall regional resource conservation. A critical element of resource conservation

is **education**, as small changes in behavior by individual residents and businesses can significantly reduce overall consumption and cost of energy and water.

The relationship of resource conservation to other *GO TO 2040* recommendations, such as those addressing land use and housing, open space, and public transit (to name a few examples) should also be recognized. The plan should address land use policies that reduce the use of energy in the transportation sector and lower per capita water consumption. Moreover, land use decisions have significant impacts on groundwater recharge capacity, water quality, and infrastructure costs. The plan should ensure that future development promotes aquifer recharge potential and water infrastructure efficiency. Finally, the plan will identify a number of other water and conservation measures that are important but less central to *GO TO 2040*, such as actions by utilities or increased use of renewable energy.

#### *Potential recommendations*

The recently submitted Chicago Region Retrofit Ramp-up application for the federal Energy Efficiency and Conservation Block grant is a first step toward creating a regional collaboration with the common goal of attaining energy and cost savings. The CMAP-led proposal requested \$75 million to leverage more than \$911 million in local resources to implement a regional strategy to create efficiencies and economies of scale by improving access to information and financing and by building a strong workforce to support retrofits. Regardless of the proposal's outcome, this dialogue should continue to maintain the momentum and partnerships built from this initiative with this specific focus. *GO TO 2040* should encourage such projects, and CMAP should continue leading this effort and encouraging current and future partners to develop retrofit targets to which they can commit. Continued funding should be sought at the federal and state levels to sustain a financial and managerial framework for regional retrofit programs. Although these efforts have solely addressed retrofits from an energy perspective thus far, they can be expanded to include water-efficient retrofit programs, with the involvement of water utilities.

*GO TO 2040* should additionally recommend updates to existing codes and ordinances (or recommend new codes where none exist) to incorporate efficiencies in energy and water consumption. The Illinois Energy Efficient Building Act of 2009, which requires newly constructed residential buildings to meet the minimum standards set forth in the most recent version of the International Energy Conservation Code (2009 IECC), presents an opportunity for the northeastern Illinois region to be a leader in the early adoption and promotion of energy-efficient buildings. Although several communities in the region have existing energy codes, there is still great potential for further savings from overall adoption of energy codes. A study completed by the Center for Neighborhood Technology for CMAP demonstrates that implementation of energy codes can reduce energy use from 15 to 30 percent by 2040. Water conservation ordinances can save up to 20 percent in water use. CMAP can work with state partners to facilitate funding streams toward these goals and to integrate code updates with existing programs such as the Local Planning Technical Assistance Act.

The *GO TO 2040* plan should support the demand management measures that emerged from the Northeastern Illinois Regional Water Supply/Demand Plan. Such measures can be accomplished through an assortment of tools including appliance and fixture retrofit to higher efficiency models, water conserving landscape programs, and water pricing. Full cost pricing, i.e., the inclusion of cost of treatment and delivery of water in the water use charge, is another mechanism for attaining water conservation by increasing consciousness of water consumption. Moreover, full cost pricing helps utilities become financially self-sufficient. *GO TO 2040* should recommend that utilities employ this measure along with metering and user-friendly water bill design to inform residents of their water use and allow them to respond accordingly. Other tools that utilities should employ include regular system water audits, leak detection, and repair. Water footprinting is another mechanism that the plan should promote to heighten awareness of water consumption and the various mechanisms for efficient use.

It is unlikely that any strategy to conserve resources will be effective without broad interest and support from the region's residents. Therefore public information and education campaigns are critical. Small changes such as turning off and unplugging electronic devices when they are not in use, using energy- and water-efficient appliances, and turning down the thermostat a few degrees can, in sum, have large regional impacts. Educational efforts targeted at schoolchildren can be particularly useful. CMAP is not well-suited to lead this public information campaign but can work with schools, local governments, and other groups to accomplish this goal.

Beyond the recommendations listed above, *GO TO 2040* addresses many other issues that also could reduce water and energy consumption. For example, the plan will recommend improvements to public transit, as well as a focus on livable communities that are walkable and oriented around transit, thereby reducing energy consumption by automobiles. It will recommend that communities consider higher densities and mixed-use development patterns, which are more efficient than conventional development patterns. *GO TO 2040* will recommend increased protection of open space, which can be targeted to protect groundwater recharge areas and surface water quality. For example, the Section 208 Plan that CMAP is responsible for developing under the Areawide Planning Agency designation, is an important tool for achieving the above goals. This Areawide Water Quality Management Plan is obligated to outline management strategies for point- and nonpoint-source pollution, groundwater protection and wastewater disposal. *GO TO 2040* should support policy integration for the implementation of the Section 208 Plan at local levels. Additionally, *GO TO 2040* will support local food systems, which can reduce (though not eliminate) the region's need to import food over long distances, while also helping to preserve prime farmland. Finally, it will seek to position the region for growth in "green jobs," including the construction work needed to implement the retrofits described above.

Clearly, the activities listed above are not a comprehensive list of ways in which energy and water consumption can be reduced. For example, increased use of renewable energy sources, such as wind or solar power, could make the consumption of energy less environmentally damaging and must be a part of a comprehensive solution. Similarly, more-efficient vehicles or cleaner fuels would reduce the negative environmental impacts of automobile use. While it will

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not include detailed recommendations for implementation in these areas, *GO TO 2040* will encourage utilities and the state and federal governments to continue to pursue these directions, as well as support small-scale adoption of renewable energy by residents or businesses.

**ACTION REQUESTED: Discussion.**

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