

# A growing urban region's attempt to meet the Kyoto protocol's CO2 emissions reduction requirements

## Assessment of Geneva's Energy Action Programs

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### Abstract

Geneva's energy policy is guided by the principles of rational energy use and renewable energy source promotion, as well as by Switzerland's Kyoto protocol commitment of a 10% reduction in 1990 CO2 emission levels. The 2001-2005 *Energy Director Plan* establishes 20 energy action programs towards these goals. The focus is almost exclusively on the thermal efficiency of buildings, because Geneva has local authority over construction standards. Special attention is paid to using the full potential of heat emissions through neighbourhood and regional planning.

### Conclusions of the assessment

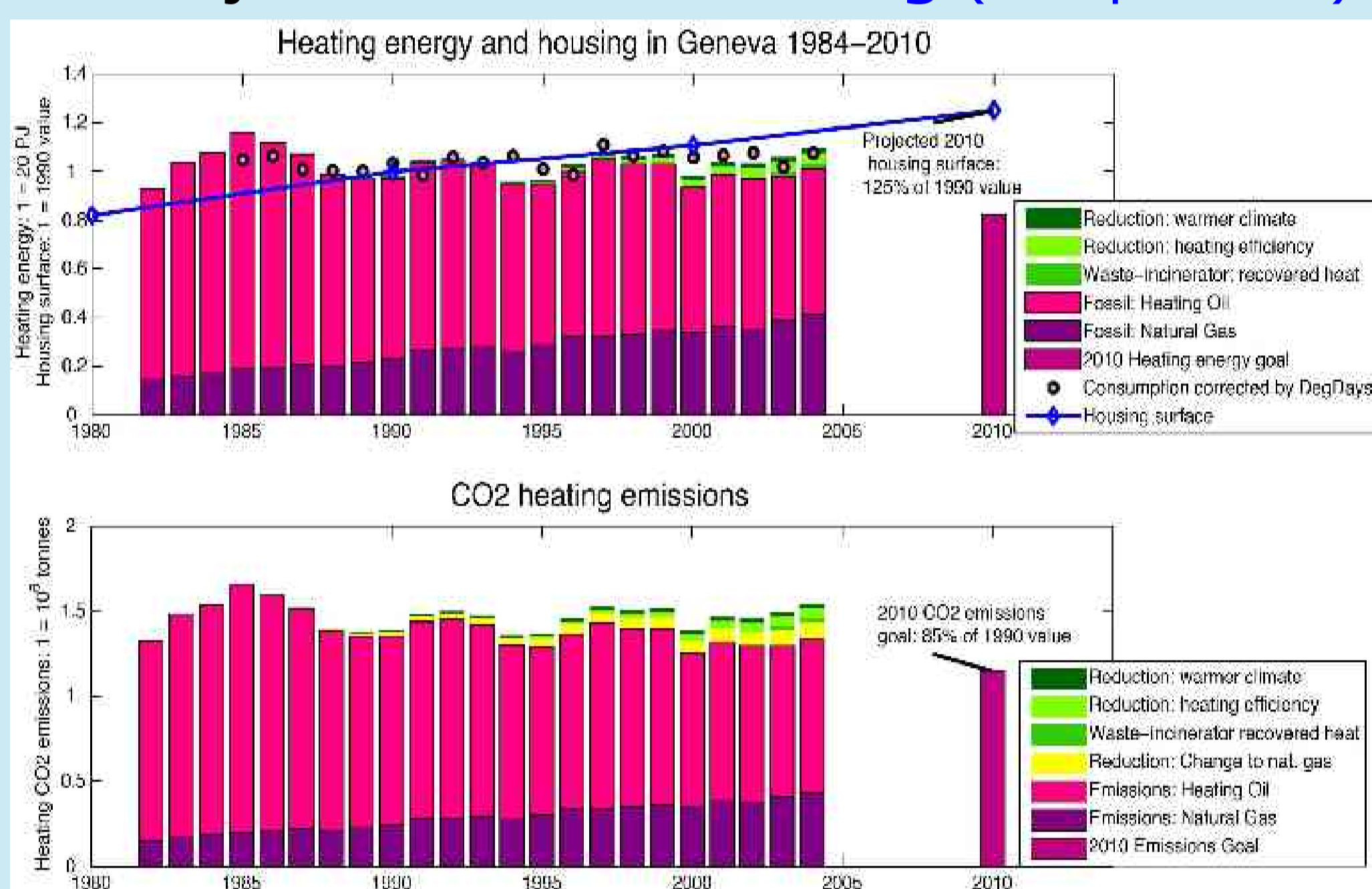
1. The goals of a fossil consumption decrease of 10% and electricity consumption stabilisation to 1990 levels will not be accomplished by 2010.
2. Renewable objectives may be met, but only because of waste-incinerator production (considered 1/2 renewable).

### Heating

**2010 Objectives:**

**-15% fossil use (comp. 1990)**  
**3% from renewable sources**

Projection: **+25% housing (comp. 1990)**



**2004 Status:**

**+16% housing** since 1990

**stabilized fossil use** ☺

**CO2 emissions: -5.7% since 1990** ☺  
(due to doubling natural gas/heating oil fraction)

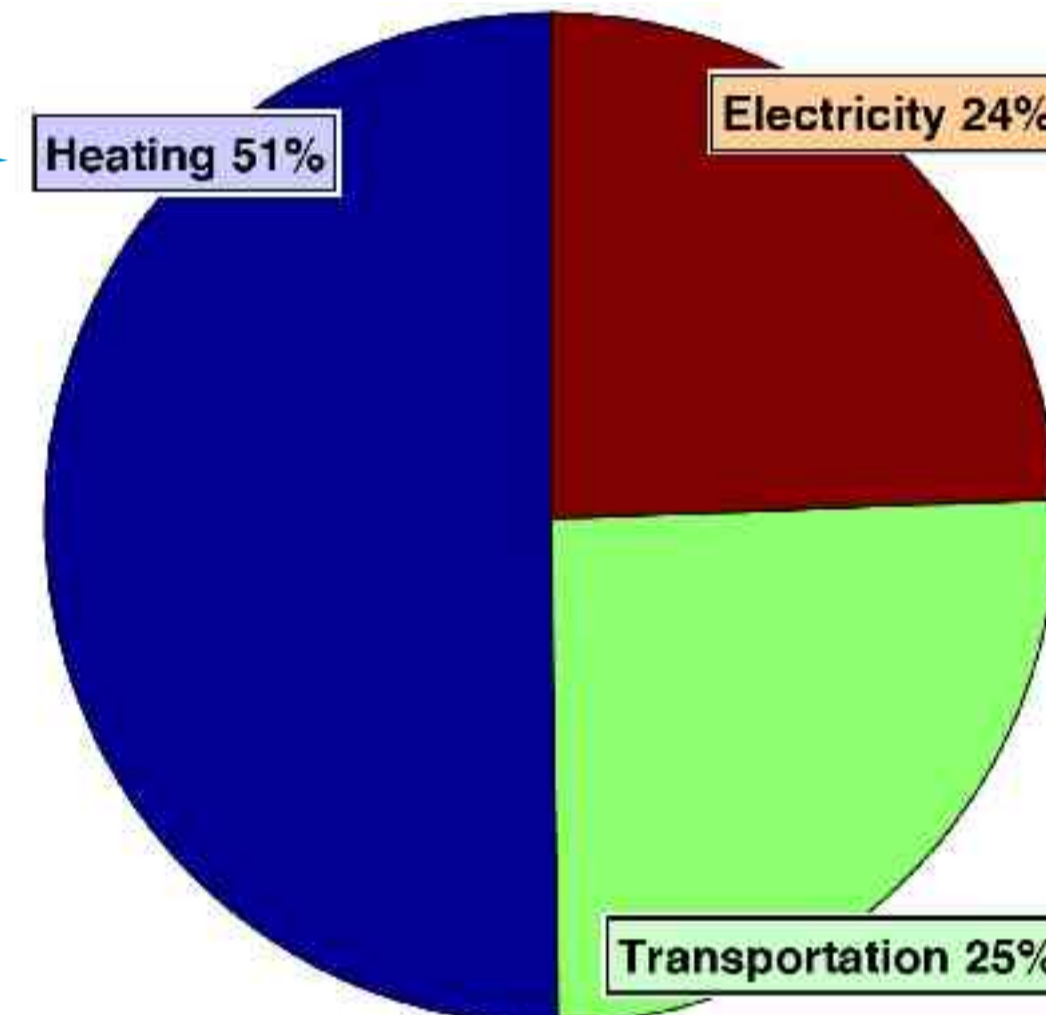
**Alternative heating sources: 1.5% "renewable"** ☺

- ⇒ 1.7% recovered waste-incinerator heat
- ⇒ 0.6% wood-heating
- ⇒ 0.05% thermal solar power

### The canton of Geneva



Population: 441'000 (+1% per year)  
Surface: 277 km<sup>2</sup>  
Home to: the UN, CERN, Intl airport.  
Energy consumption: **41 PJ/year**



**CO2 emissions: 2.2 million tonnes/y**

Does not include:

- Airport (equiv 80% of transportation)
- CERN (equiv 30% of electricity)

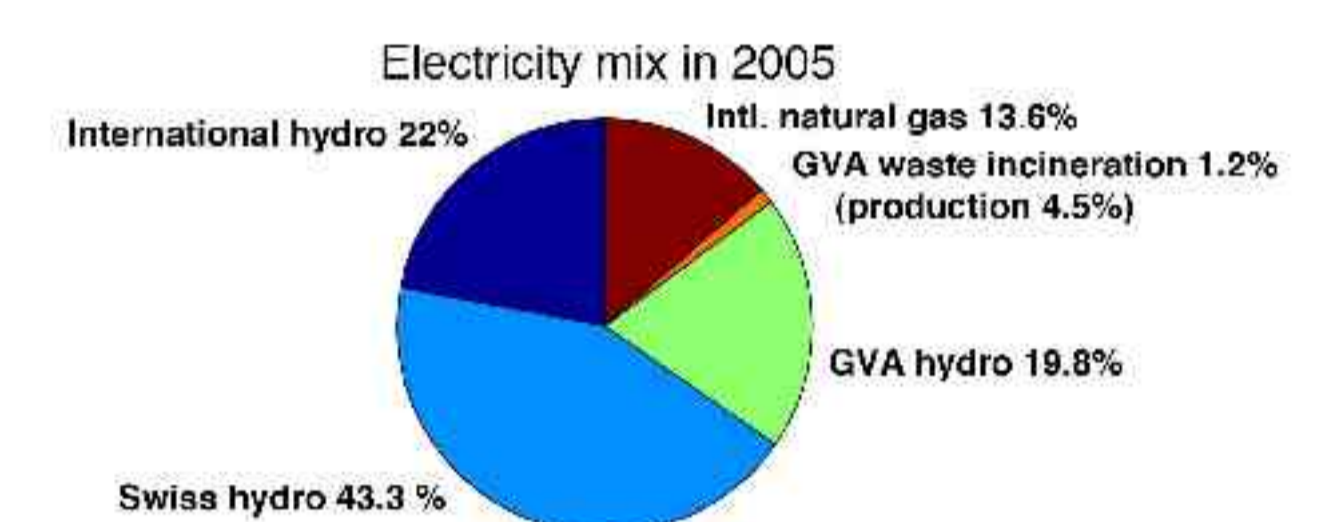
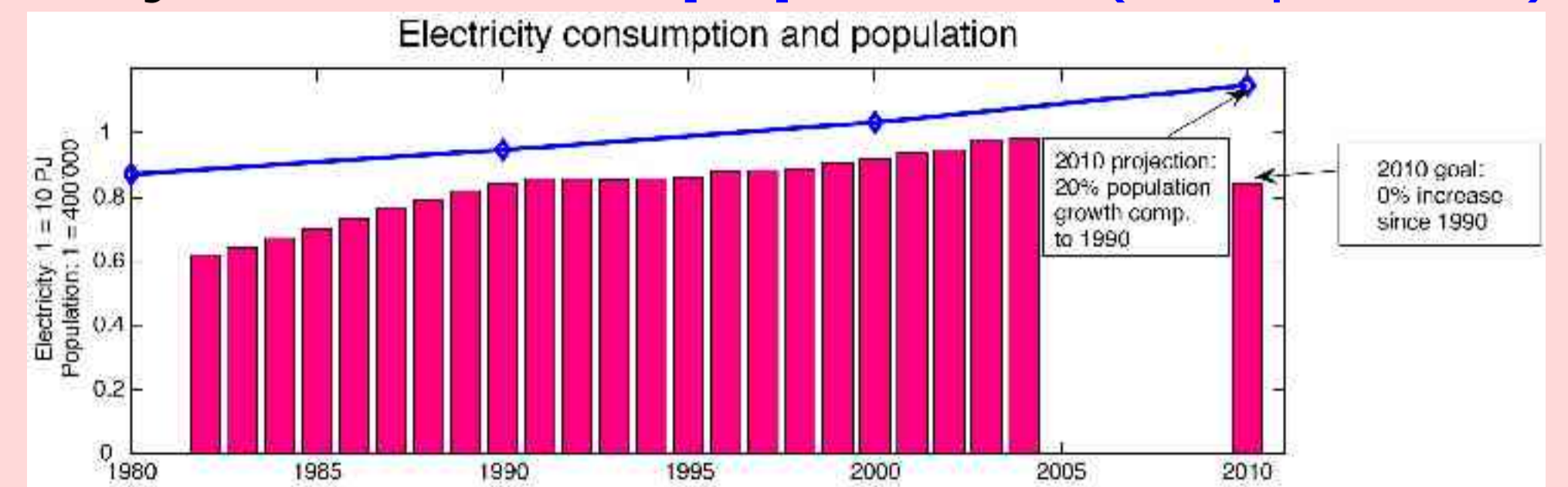
### Electricity

**2010 Objectives:**

**stabilize consumption at 1990 level**  
**1% from renewable sources**

**Certify nuclear-free** (Geneva specific)

Projection: **+20% population (comp. 1990)**



**2004 Status:**

**+14% consumption since 1990** ☹  
= stabilized per capita consumption

**13.6% fossil use, because nuclear-free**

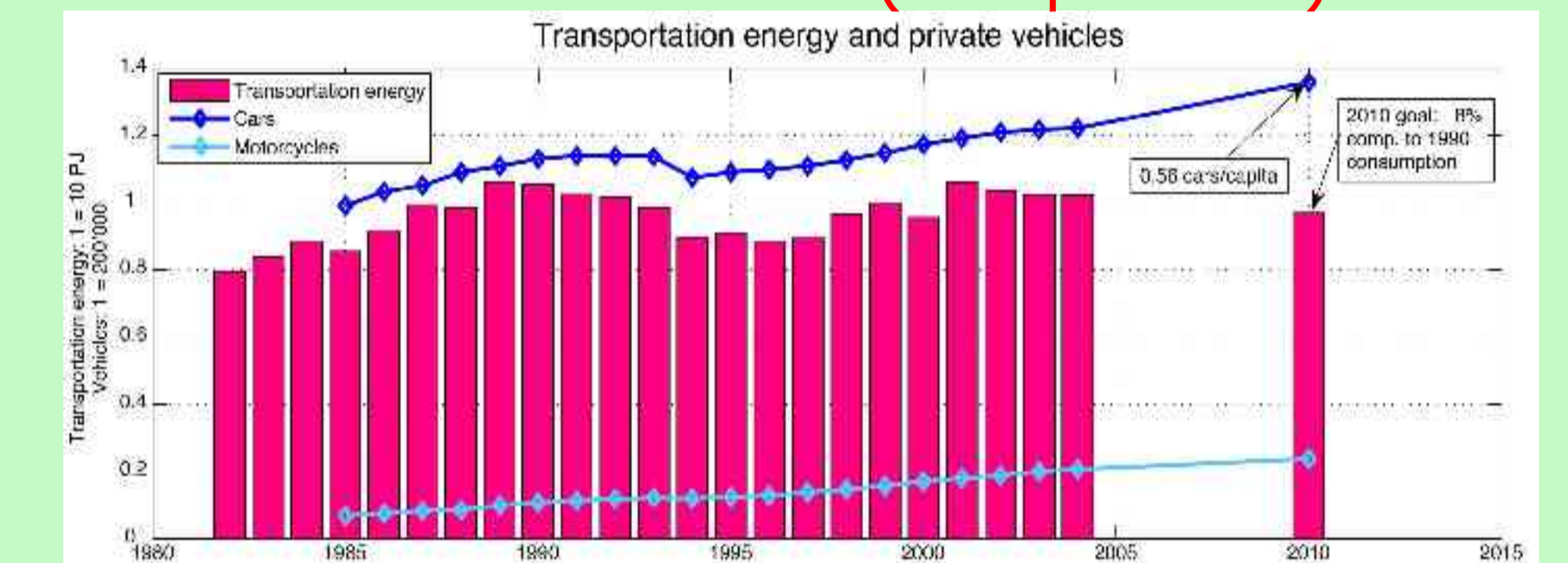
**Alternative sources: 0.63% "renewable"** ☺

- ⇒ 1.2% waste-incinerator electricity (production 4.5%, but not selling well)
- ⇒ 0.06% micro-hydro and PV solar

### Transportation

**2010 Objectives:**

**-8% fossil use (comp. 1990)**



**2004 Status:**

**-3% consumption (not long term trend)** ☹

- ⇒ most elastic consumption
- ⇒ visible intermittent increase in vehicle efficiency
- ? jeopardized by recent SUV purchasing trend ☹

### Identification of Most Effective Programs

#### 1. Energy inclusion in territorial planning

**Strategy:** insert energy considerations into existing procedures at regional, neighbourhood and building scales.

**Facilitate:** ⇒ high efficiency standards (Minergie)

- ⇒ energy synergies for industrial zones <sup>(1)</sup> or neighbourhoods
- ⇒ encourage alternative energy sources.

**Ex 1:** recovering waste-incinerator heat for municipality of Onex.

**Ex 2:** the Genève-Lac-Nations project exploits Lake Geneva as a temperature reservoir for heating (winter) and cooling (summer) the UN neighbourhood.

#### 2. Regulating the thermal efficiency of buildings

**Strategies:** ⇒ reduce energy needs through high efficiency standards

- ⇒ act on owners, upstream of tenant behaviour
- ⇒ reduce enforcement burden by providing strong incentives: either install expensive heat meters or reduce building heat index below threshold.

**Facilitate:** higher efficiency standards for larger consumers.

**Result: 1% yearly reduction in Geneva's housing heating.**

(1) See Guillaume Massard's poster "A method to implement Industrial Symbiosis in moderately industrialized areas - Case Study: Geneva region, Switzerland"

### Geneva Energy Service: Activities and goals

**Regulation:** formulate and enforce regulations, provide compliance options with incentives towards efficiency.

**Facilitation:** work closely with large consumers on long term energy strategies, identify efficiency potentials and help obtain financing for energy investments.

**Training:** organize classes in architecture and engineering schools.

**Economic goals:** local control of energy, energy savings, reduced repercussions of energy cost fluctuations, transfer energy costs to local investments.

### Energy policy recommendations

1. Energy efficiency **regulation can be positive** for local economies, environment, societies.
2. Most **fossil energy savings result from improved efficiency** in a context of total consumption management, not from renewable technologies. Efficiency regulation and planning have huge untapped potential in developed and developing countries.
3. **Renewables are not alternatives** to the current fossil supply. Renewables can only support drastically reduced consumption.
4. **The Kyoto goals may be achieved** through a schedule of increasingly stringent efficiency standards, including electricity and transportation, implemented with flexible regulation and incentives.

**Thanks to:** in Geneva, the ScanE (Geneva Energy Service), Environnement-Info, SIG (Geneva Industrial Services), the Geneva Statistics Office, Andrea Baranzini in Switzerland, the ARE (Federal Office for Spatial Development).