

Strengthening National Capacities for Sustainable Housing, Urban  
Development and Land Management: National Action Plans  
31 January 2017, Belgrade

# SUSTAINABLE HOUSING AND URBAN DEVELOPMENT

**Dr Oleg Golubchikov**



# SUSTAINABLE HOUSING FOR SUSTAINABLE CITIES

A POLICY FRAMEWORK FOR DEVELOPING COUNTRIES



UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

## Green Homes

Towards energy-efficient housing in the UNECE region

UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE  
ЕВРОПЕЙСКАЯ ЭКОНОМИЧЕСКАЯ КОМИССИЯ ОРГАНИЗАЦИИ ОБЪЕДИНЕННЫХ НАЦИЙ

UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

## Climate Neutral Cities

How to make cities less energy and carbon intensive and more resilient to climatic challenges

UNITED NATIONS

## ЗЕЛЕННЫЕ ДОМА

Обеспечение энергоэффективности жилья в регионе Европейской экономической комиссии Организации Объединенных Наций

Организация Объединенных Наций

## ACTION PLAN FOR ENERGY-EFFICIENT HOUSING IN THE UNECE REGION

## ПЛАН ДЕЙСТВИЙ ПО СОЗДАНИЮ ЭНЕРГОЭФФЕКТИВНОГО ЖИЛИЩНОГО ХОЗЯЙСТВА В РЕГИОНЕ ЕЭК ООН

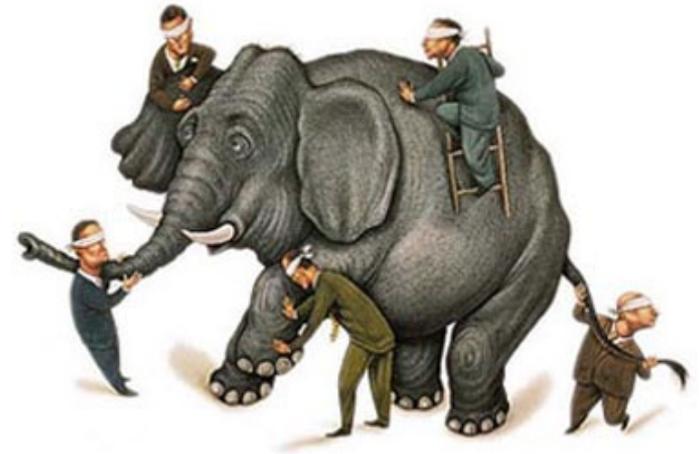
# Outline

- Sustainable housing and cities
- A narrower focus: energy
- Policy dimensions



# Why sustainable housing?

- Different understandings of “housing”
- Lowest common denominator: housing output (e.g. next slide)
- SH: more holistic approach: housing is deeply connected with the economy, social development, urban fabric
- Housing is more than building buildings





# Sustainable Housing Policy

## Environment

Housing system to use resources prudently and efficiently, limiting ecological footprint

## Equity

Housing system to ensure everyone has access to a decent, safe, and affordable home in a desirable place

## Economy

Housing system to support a strong, responsive and competitive economy

Policy delivery

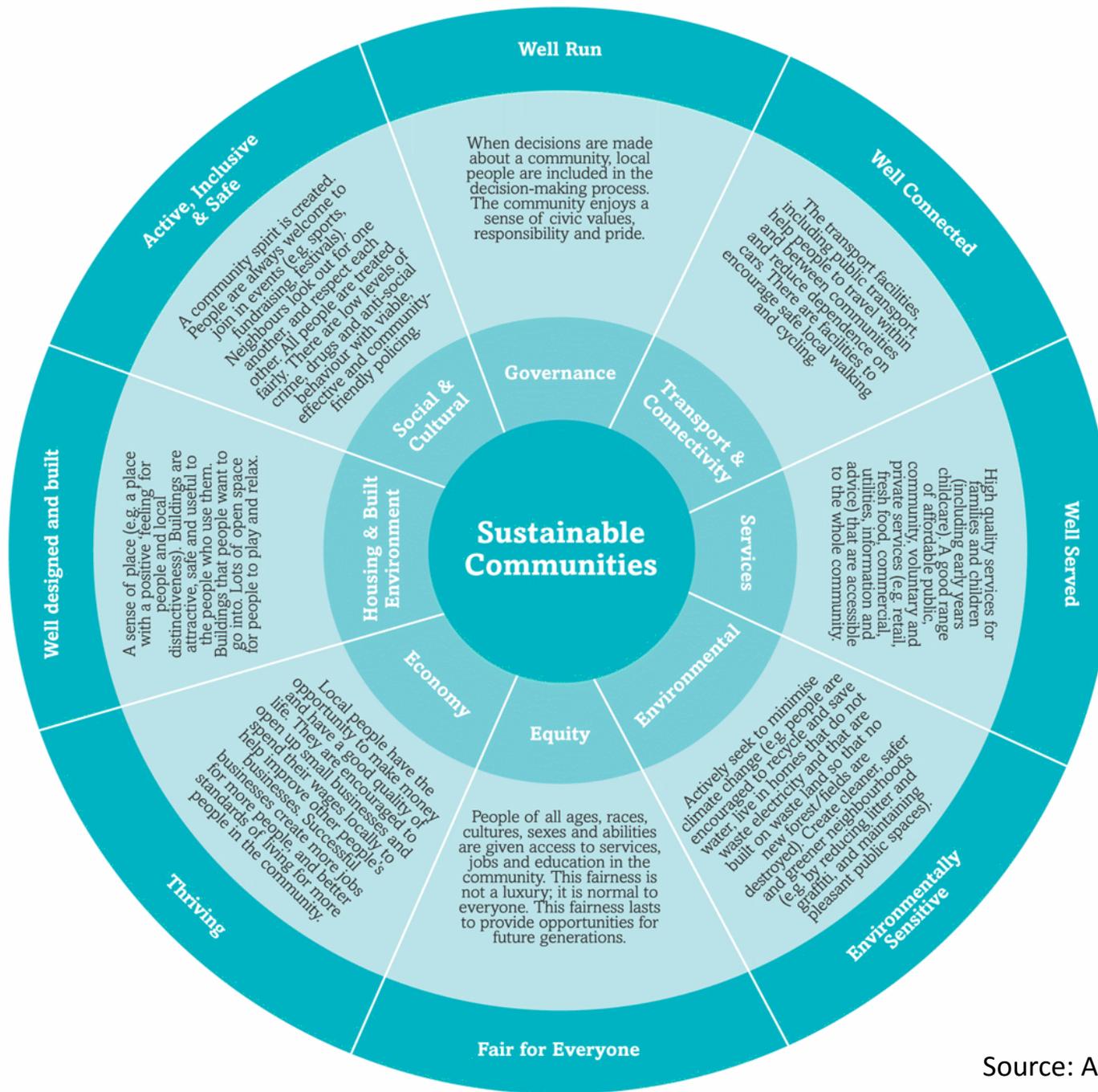
Multi-level, multi-stakeholder governance, cross-sectoral cooperation

Tools: action plans, housing strategies, building regulations, spatial planning, land provision, funding, capacity building

# Egan Wheel: sustainable communities



Source: Office of Deputy PM, UK



Source: ASC (2006)

# Multi-scale framework for sustainable housing policy

	Nation (regulation and oversight)	City (planning and implementation)	Neighbourhood (building and living)
Environmental	<ul style="list-style-type: none"> <li>• Planning and building regs</li> <li>• Climate and energy policies</li> <li>• Resource efficiency standards</li> <li>• Hazards prevention</li> <li>• Mainstreaming green building</li> </ul>	<ul style="list-style-type: none"> <li>• Appropriate location, density</li> <li>• Ecosystem protection</li> <li>• Low-carbon infrastructure</li> <li>• Transport infrastructure</li> <li>• Waste management</li> </ul>	<ul style="list-style-type: none"> <li>• Ensuring resource efficiency</li> <li>• Green design, greening</li> <li>• Preventing hazardous materials</li> <li>• Climate/disaster protection of buildings</li> <li>• Recycling provision</li> </ul>
Social	<ul style="list-style-type: none"> <li>• Participation laws</li> <li>• Right to (adequate) housing</li> <li>• Affordable decent homes</li> <li>• Social housing frameworks</li> </ul>	<ul style="list-style-type: none"> <li>• Integrated communities</li> <li>• Urban facilities, public spaces</li> <li>• Integrating housing in urban areas</li> <li>• Slum upgrade</li> </ul>	<ul style="list-style-type: none"> <li>• Health, safety, well-being</li> <li>• Access to social and hard infrastructure</li> <li>• Sense of community</li> <li>• Accessible/inclusive buildings</li> </ul>
Cultural	<ul style="list-style-type: none"> <li>• Education and information</li> <li>• Heritage protection</li> <li>• Links with cultural economies</li> <li>• Indigenous, local knowledge</li> </ul>	<ul style="list-style-type: none"> <li>• Urban creativity, diversity</li> <li>• Shaping values and norms</li> <li>• Protecting housing heritage</li> <li>• Traditional building techniques</li> </ul>	<ul style="list-style-type: none"> <li>• Aesthetics of the built environment</li> <li>• Culturally-responsive design</li> <li>• Helping community creativity</li> <li>• Assisting migrant transition</li> </ul>
Economic	<ul style="list-style-type: none"> <li>• Budget and fiscal capacities</li> <li>• National spatial planning</li> <li>• National infrastructure</li> <li>• Housing management regs.</li> <li>• Mortgage regulations</li> </ul>	<ul style="list-style-type: none"> <li>• Infrastructure, land supply</li> <li>• Development control</li> <li>• Local building industry</li> <li>• Regional and urban regeneration</li> <li>• Integrating housing and jobs</li> </ul>	<ul style="list-style-type: none"> <li>• Housing management/maintenance</li> <li>• Supporting domestic activities</li> <li>• Promoting self-help housing</li> <li>• Resilience and future-proofing</li> </ul>



# Roles cities play today

- Implementation sites of national policies
- Administrative entities responsible for planning, procurement, management
- Actors in inter-urban networks and multi-level governance arrangements
- Cities as sites of experimentations and innovations

... Narrowing the focus: energy



City	Reduction targets	Base year	Strategy
<b>Copenhagen</b>	20%, 2015 carbon neutral, 2025	2005	Climate Plan, 2009
<b>Stockholm</b>	37%, 2015 carbon neutral, 2050	1990	Stockholm action plan for climate and energy 2010–2020
<b>Hamburg</b>	30%, 2012 40%, 2020 80%, 2050	1990	Hamburg Climate Action Policy, 2007 (revision 2009/2010)
<b>London</b>	20%, 2015 40%, 2020 60%, 2025 80%, 2050	1990	The Mayor's Climate Change Mitigation and Energy Strategy, 2011
<b>Rotterdam</b>	50%, 2025	1990	Climate Initiative, 2007
<b>Vancouver</b>	33%, 2020 80%, 2050	1990	A Community Climate Change Action Plan for the City, 2005; Climate Leadership, 2009
<b>Chicago</b>	25%, 2020 80%, 2050	1990	Climate Action Plan, 2008
<b>Paris</b>	30%, 2020 (city)	2004	The Climate Protection Plan, 2007
<b>Madrid</b>	20%, 2020 50%, 2050	2004	City of Plan for the Sustainable Use of Energy and Climate Change Prevention, 2008

# Priority sectors for urban energy

<b>Energy infrastructure</b>	Efficiency + RE supply + smart energy grids
<b>Urban form and mobility</b>	Non-motorised and public transport + a mixed-use urban forms + polycentric developments
<b>Buildings</b>	Performance standards, retrofit, management
<b>Green areas</b>	Green/compact city fusion, green and water areas
<b>Waste</b>	Recycling and waste-to-energy technologies

**The importance of the integrative role of urban planning!**

# 100% renewable cities?

UK world politics sport football opinion culture business lifestyle fashion environment tech tr

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Guardian sustainable business  
Innovations in renewables

## Australian first: Newstead aims to run on 100% renewable energy within five years

Agreement with energy company Powercor will see Victorian town move to solar power, save money and perhaps become a model for other towns

Giles Parkinson

Monday 29 February 2016 22:43 GMT

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1,342 Shares 18 Comments

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## Climate change

### Most of Britain's major cities pledge to run on green energy by 2050

Leaders of more than 50 Labour-run councils sign pledge to eradicate carbon emissions ahead of Paris climate talks

Rowena Mason Political correspondent

Monday 23 November 2015 16:34 GMT

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This article is 3 months old

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A workman cleans panels at Landmead solar farm near Abingdon, Oxfordshire. Photograph: Peter Macdiarmid/Getty Images

Most of Britain's major cities will be run entirely on green energy by 2050, after the leaders of more than 50 Labour-run councils made pledges to eradicate carbon emissions in their areas.

In a highly significant move, council leaders in Edinburgh, Manchester, Newcastle, Liverpool, Leeds, [Nottingham](#), Glasgow and many others signed up to the promise ahead of the crucial international climate talks that will take place next month in Paris. Labour said this would cut the UK's carbon footprint by 10%.

The pledge, coordinated by Lisa Nandy, the shadow energy and climate change secretary, will mean green transport, an end to gas heating and a programme of mass insulation of homes in cities across the UK.

The move will also pile pressure on the London mayoral candidates to make a similar pledge for the capital, with some Labour-led [London](#) boroughs, including

Small is beautiful: the community solar projects taking on big energy

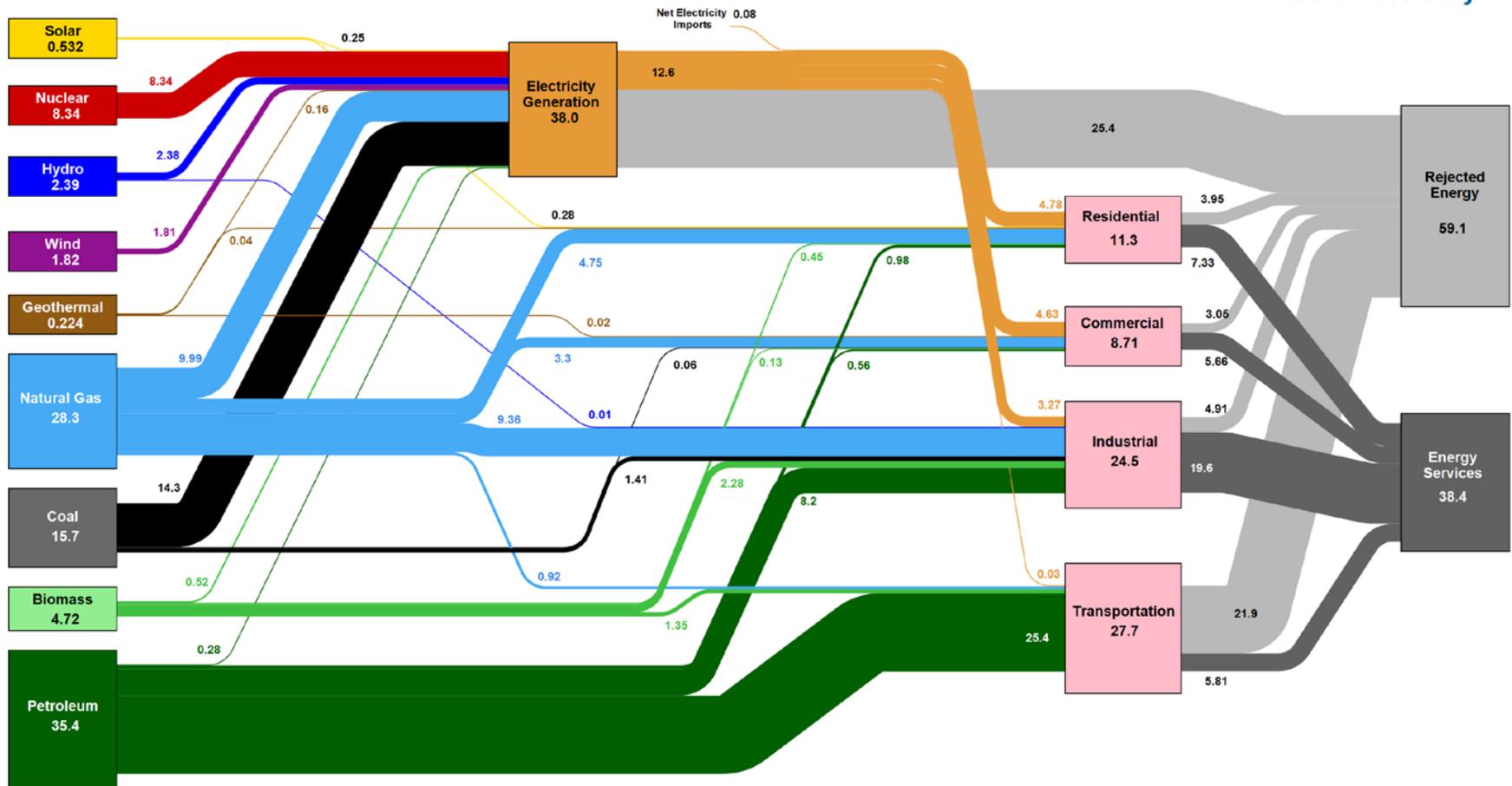
Read more

Focusing on electricity

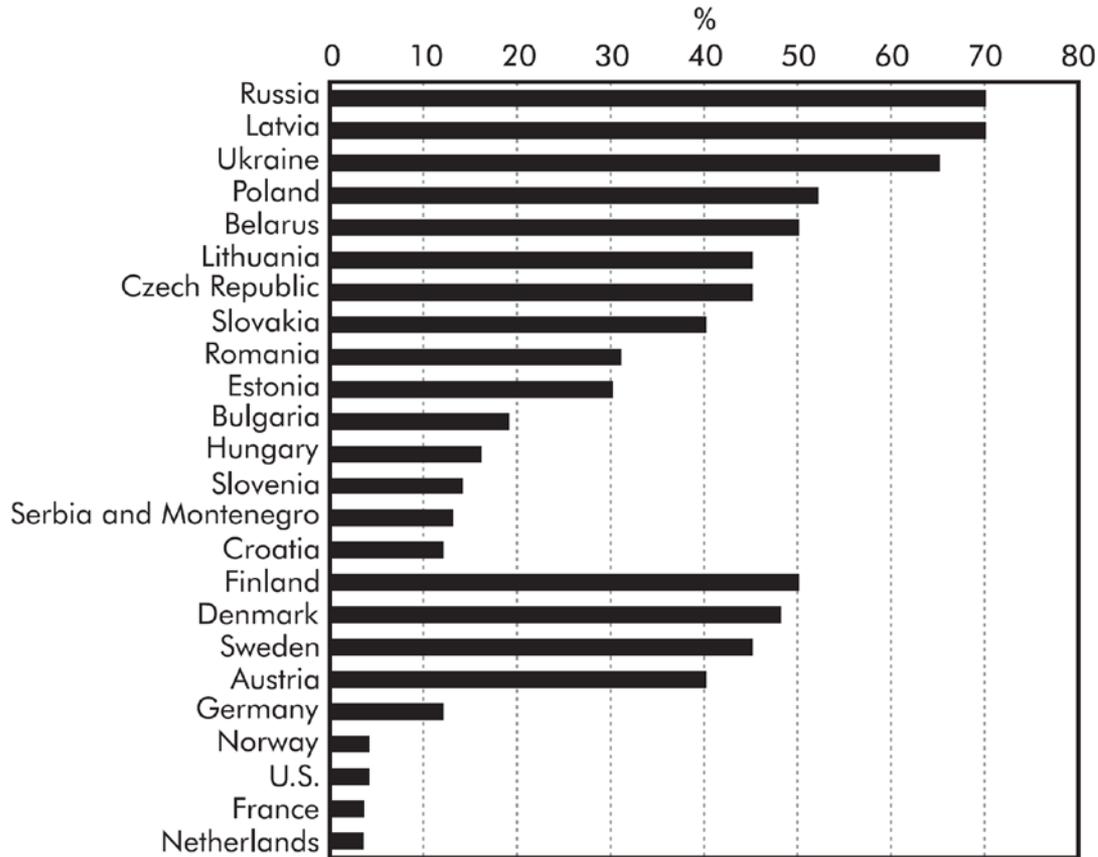
But how about heating, transport, waste, energy embedded in buildings?

# Most primary energy we use is... unused

Estimated U.S. Energy Consumption in 2015: 97.5 Quads



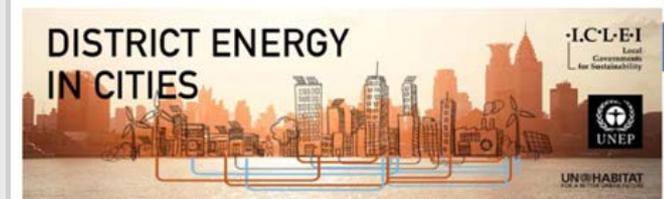
## District Heating's Share of the Residential Heating Market



Note: Not all countries collect compatible and regular data on their district heating markets. For the most part, data are shown for 2001, but for some countries only earlier data were available. Sources: Euroheat and Power (2003 and 2001); Gochenour (2001).

Source: IEA (2004) *Coming in from the Cold*, p.42

### Belgrade to become a champion of low-carbon district heating



UNEP is among bodies providing technical advice for the overhaul of Belgrade's district heating system, with the aim of securing major efficiency gains.

A wide range of stakeholders – including the private sector and finance institutions – were consulted in Belgrade's Hotel Metropol today on possible ways of rehabilitating and integrating renewables in the city's district heating system.

The network is 86% powered by natural gas, but Belgrade is eager to explore other sources of energy, including possibilities of cogeneration.

"We are very happy that our determination to join the Global Initiative has brought concrete results," said Ms. Stana Bozovic, State Secretary of Republic of Serbia, at today's event.

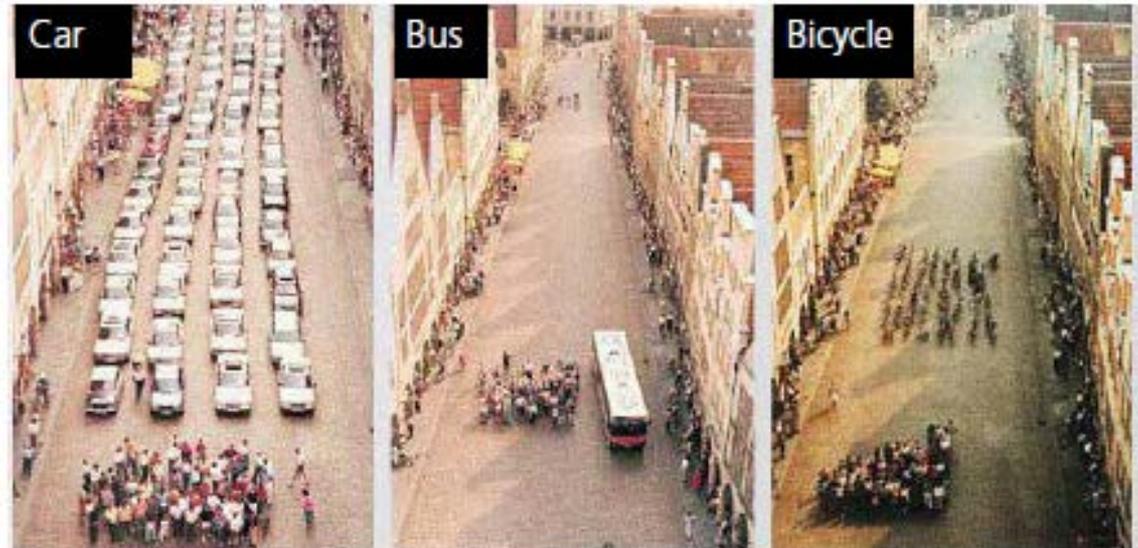
UNEP's [Global District Energy in Cities](#) Initiative, of which Belgrade is one of the first pilot cities, aims to drive a switch to low-carbon, energy efficient heating by developing, retrofitting or scaling-up district energy systems.

The Serbian capital will be provided with best practice guidance and support and be linked with other district energy champions such as Paris, Helsinki, Warsaw and Tokyo.

The District Energy Initiative is one of five accelerators of the SE4All Energy Efficiency Accelerator Platform launched at the UN Climate Summit held in September 2014. The scheme aims to double the rate of

# Urban form and transportation

- Reducing travel distances - land use planning
- Modal shift and demand management - walking, cycling, public transport
- Electrification of transports



Space required to transport 60 people © Press Office City of Munster, Germany



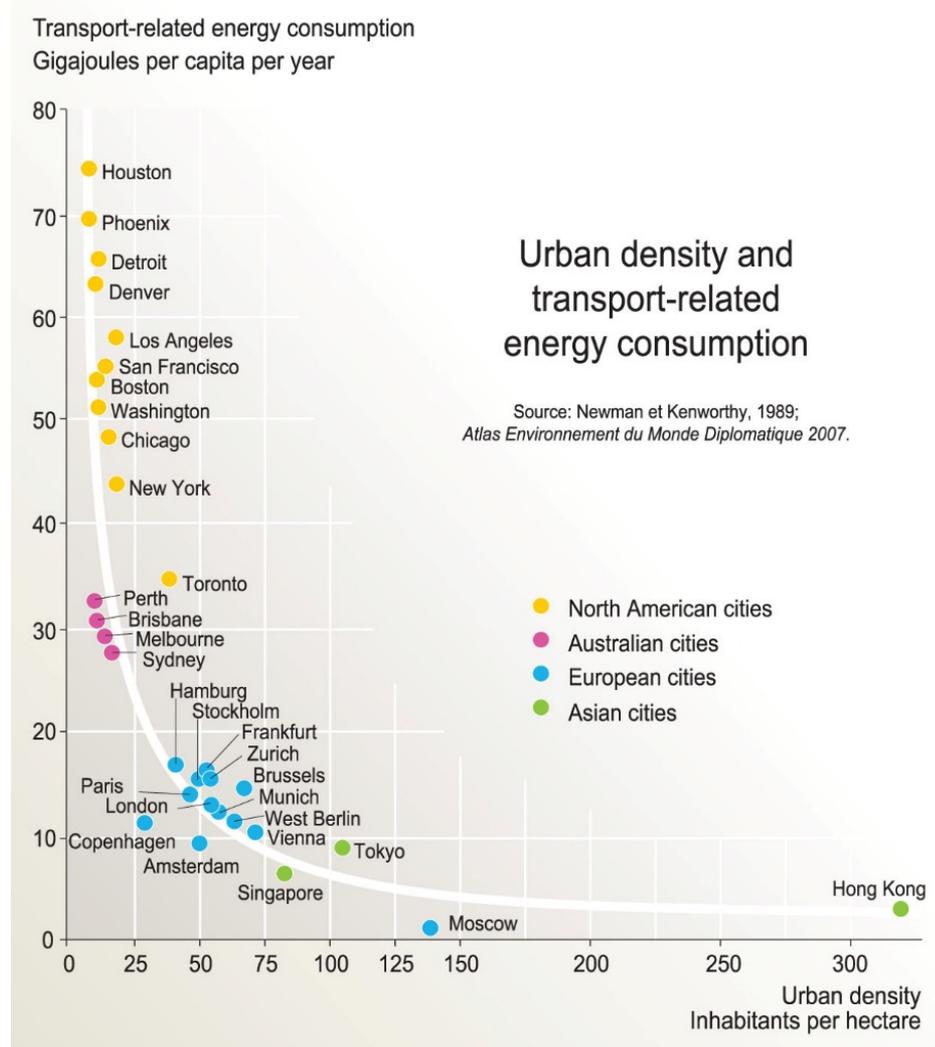
La Paz in Bolivia

Table 4.10 Policy Options for the Transport Sector

			
<ul style="list-style-type: none"> <li>- Alternative Work Schedules</li> <li>- Bicycle Improvements</li> <li>- Bike/Transit Integration</li> <li>- Car sharing</li> <li>- Flexitime</li> <li>- Guaranteed Ride Home</li> <li>- Individual Actions for Efficient Transport</li> <li>- Park &amp; Ride</li> <li>- Pedestrian Improvements</li> <li>- Ridesharing</li> <li>- Shuttle Services</li> <li>- Small Wheeled Transport</li> <li>- Taxi Service Improvements</li> <li>- Telework</li> <li>- Traffic Calming</li> <li>- Transit Improvements</li> <li>- Universal Design</li> </ul>	<ul style="list-style-type: none"> <li>- Walking and Cycling Encouragement</li> <li>- Commuter Financial Incentives</li> <li>- Congestion Pricing</li> <li>- Distance-Based Pricing</li> <li>- Fuel Taxes</li> <li>- HOV (High Occupant Vehicle) Priority</li> <li>- Parking Pricing</li> <li>- Pay-As-You-Drive</li> <li>- Vehicle Insurance</li> <li>- Road Pricing</li> <li>- Speed Reductions</li> <li>- Street Reclaiming</li> <li>- Vehicle Use Restrictions</li> </ul>	<ul style="list-style-type: none"> <li>- Bicycle Parking</li> <li>- Car-Free Districts and Pedestrianized Streets</li> <li>- Clustered Land Use</li> <li>- Location Efficient Development</li> <li>- New Urbanism</li> <li>- Parking Management</li> <li>- Parking Solutions</li> <li>- Parking Evaluation</li> <li>- Shared Parking</li> <li>- Smart Growth</li> <li>- Smart Growth Planning and Policy Reforms</li> <li>- Transit Oriented Development (TOD)</li> </ul>	<ul style="list-style-type: none"> <li>- Access Management</li> <li>- Car free Planning</li> <li>- Commute Trip Reduction Programmes</li> <li>- Market Reforms</li> <li>- Context Sensitive Design</li> <li>- Freight Transport Management</li> <li>- Institutional Reforms</li> <li>- Least Cost Planning Regulatory Reform</li> <li>- School Transport Management</li> <li>- Special Event Management</li> <li>- TDM Marketing</li> <li>- Tourist Transport Management</li> <li>- Transport Management Associations</li> </ul>

# The role of urban planning

- Limit urban sprawl: density and mixed-use development
- Transit-oriented development
- Prevent social segregation
- Closed-loop cities?



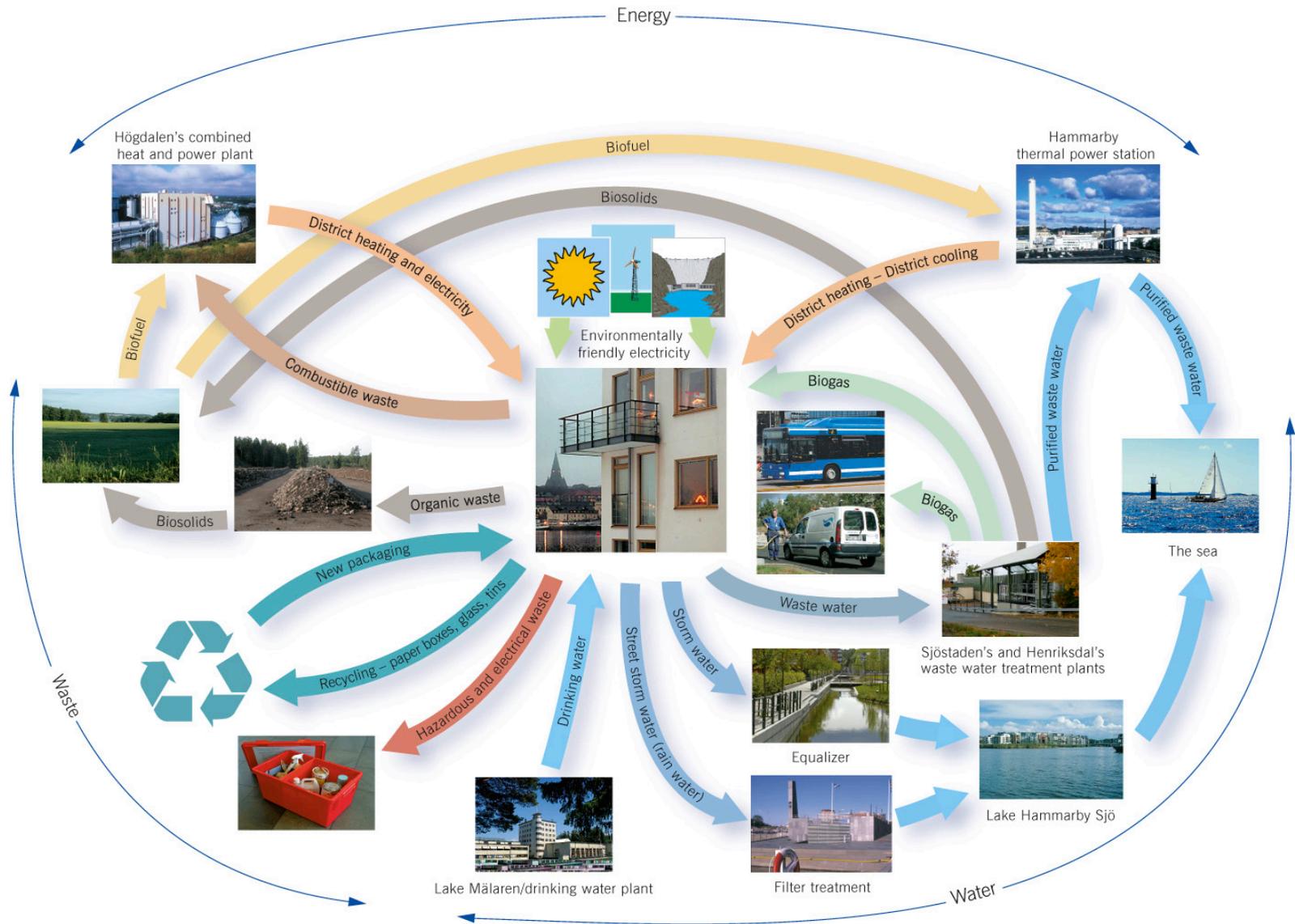
Source: *Kick the Habit: A UN Guide to Climate Neutrality*

# Sustainability in the socialist city

- Strong planning, resource efficiency
- Public transit orientation
- Integration of social infra/housing/work
- District heating
- Generous public and green spaces
- Social equality, socio-spatial mix
- Affordable housing
- Strong security of tenure
- Yet: uniformity, housing shortages, lack of disability support, construction quality



# “Hammarby model”: energy, waste, water



Video: <http://www.time.com/time/magazine/article/0,9171,1917732,00.html>

# Buildings sector: the case of Brussels

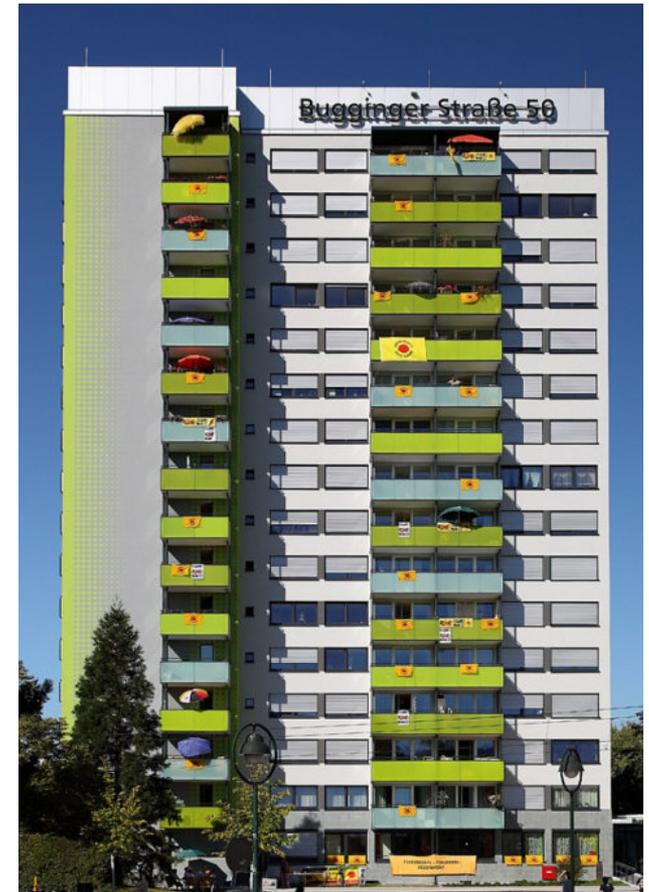
New-builds in the Brussels Region from 1 January 2015:

- a net heating requirement of  $\leq 15\text{kWh/m}^2$  per year;
- an over-heating risk (inside temperature of more than  $25^\circ\text{C}$ ) of  $< 5\%$  of the time;
- a primary energy consumption of  $\leq 45\text{ kWh/m}^2$  per year;
- an air density of  $n_{50} \leq 0.6$  volumes/u (transitional system until 2018)



# Retrofitting buildings

- New builds add 1% or less of the total building stock each year
- The importance of energy retrofit of the existing stock
- Important for resolving fuel/energy poverty
- All sorts of challenges – financial, technical, ownership consensus



Energy retrofit of 16-storey high-rise building in Freiburg to the passive house standard

# UNECE Action plan for energy efficient housing

## Governance

1. Leadership, planning, monitoring
2. Financial incentives
3. Housing management & maintenance
4. Utility services, energy pricing

Capacities to close energy efficiency gap

## Technology

5. Energy performance requirement
6. Low-energy and zero-carbon technology
7. Spatial planning, district heat
8. Research, innovations

Low carbon homes

## Equity

9. Public/social housing
10. Energy affordability and social integration
11. Awareness-raising and capacity building
12. Geographical context, cooperation

Inclusive energy

# Conclusion

- Sustainability offers a holistic cross-sectoral perspective
- National action plans: seeking transformative results
- Political commitment and stakeholders support
- Multi-level perspectives
- Fostering urban experiments
- Capacity to learn

Thank you!

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