



Buildings, Appliances and Industry: Energy Demand Trends and Opportunities

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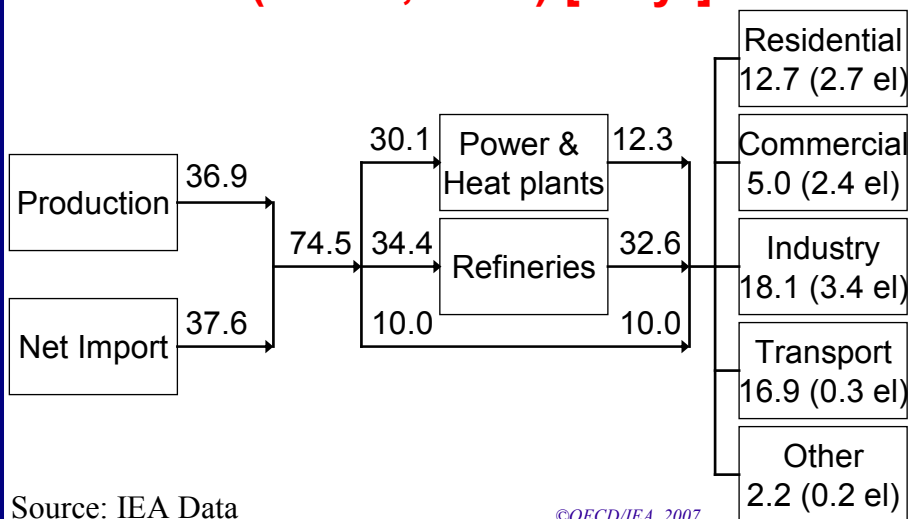
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The European Energy System (EU-19, 2004) [EJ/yr]



Source: IEA Data

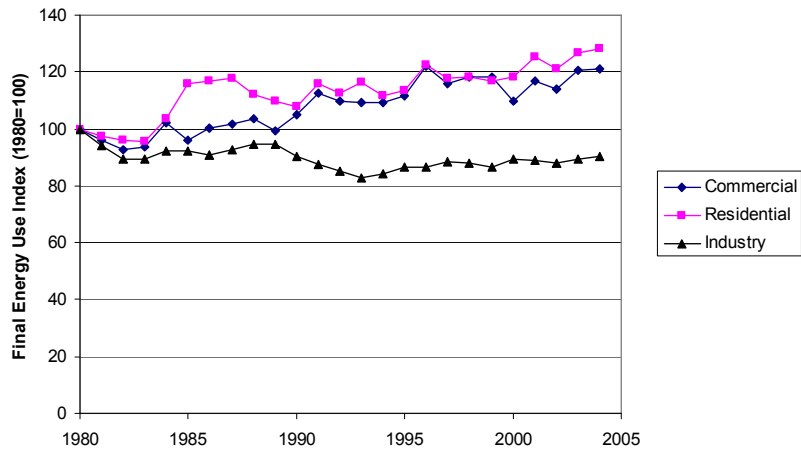
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Growth in total final energy use, EU-19, 1980-2004



Source: IEA Data

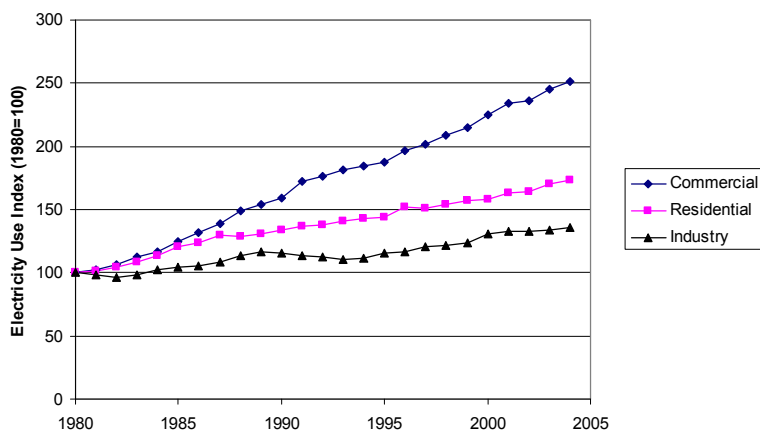
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Growth in electricity use, EU-19, 1980-2004



Source: IEA Data

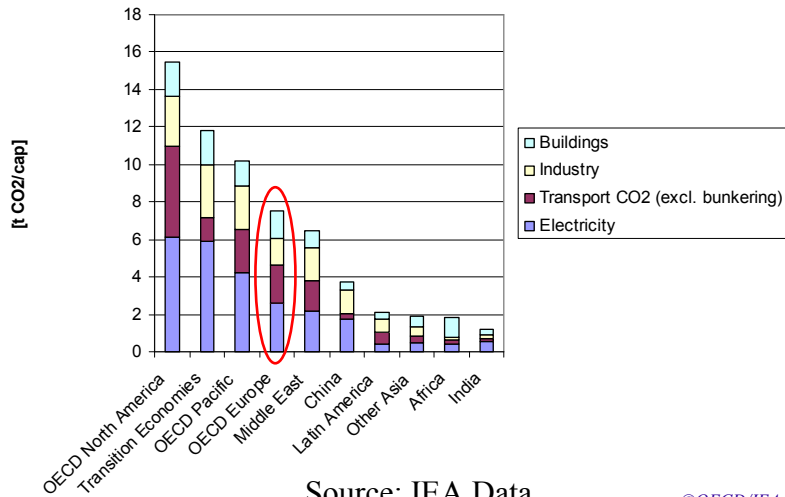
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Energy CO₂ Emissions Per capita, 2004



Source: IEA Data

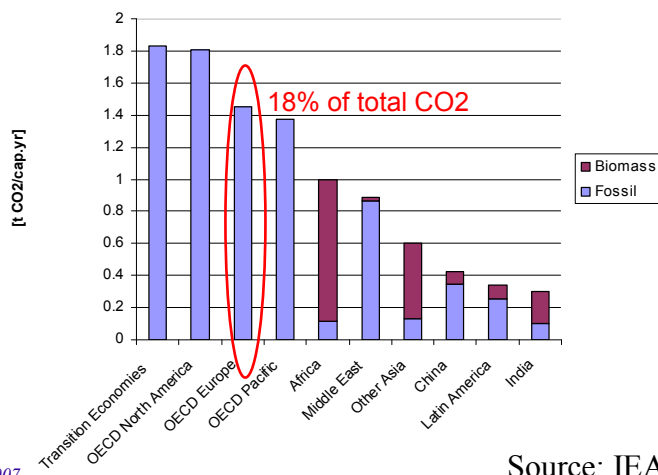
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Direct CO₂ Emissions from Buildings



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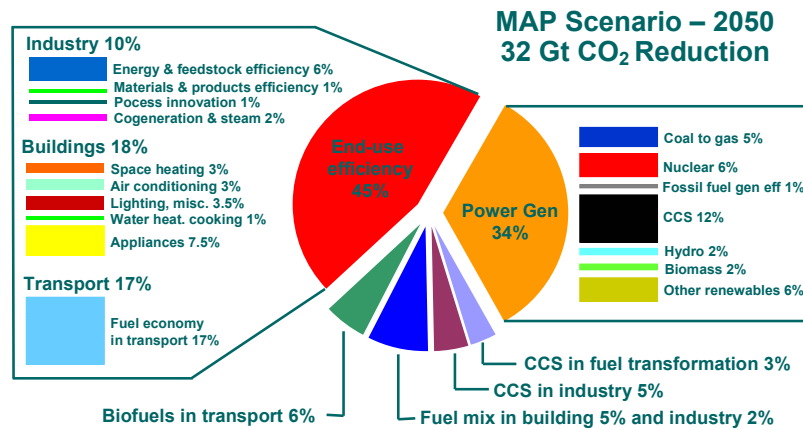
Source: IEA Data

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Emission Reduction by Technology Area ACT Map Scenario



Improved energy efficiency most important contributor to reduced emissions

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End-Use Efficiency

- A key opportunity
- Use of proven technologies can result in major savings
- Market imperfections pose a challenge
- “Second best” policies needed (Standards and Regulations)

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Example: Industry

	EJ	EJ	Mtoe	Mtoe	Gt CO2	Gt CO2
<i>Sectoral improvements</i>						
Chemicals/petrochemicals	3	6	71.7	143.3	0.219	0.438
Iron and Steel	3	5	71.7	119.4	0.210	0.350
Cement	2.5	3	59.7	71.7	0.475	0.522
Aluminium	0.3	0.4	7.2	9.6	0.021	0.028
Other non-metallic minerals	1	1	23.9	23.9	0.070	0.070
Pulp and paper	2	2	47.8	47.8	0.080	0.140
<i>System/life cycle improvements</i>						
Motor systems	6	8	143.3	191.1	0.420	0.560
CHP	4	6	95.5	143.3	0.224	0.336
Steam systems	3	5	71.7	119.4	0.210	0.350
Process integration	2	5	47.8	119.4	0.140	0.350
Increased recycling	3	4	71.7	95.5	0.282	0.376
Energy recovery	3	5	71.7	119.4	0.282	0.470
Total	25.3	37.9	604.3	905.2	2.064	3.049
Industrial improvement potential [%]	17.4	26.1	17.4	26.1	20.6	30.5
Global improvement potential [%]	5.4	8.1	5.4	8.1	7.9	11.7

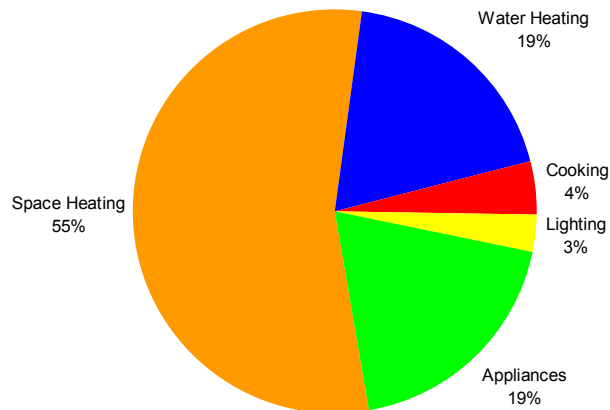
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Buildings Energy Demand Structure (World Average)



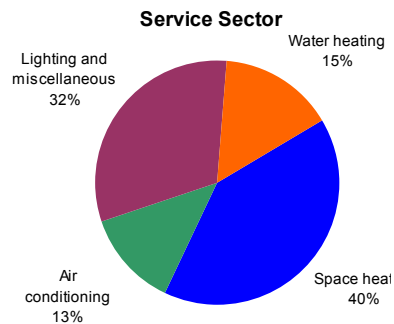
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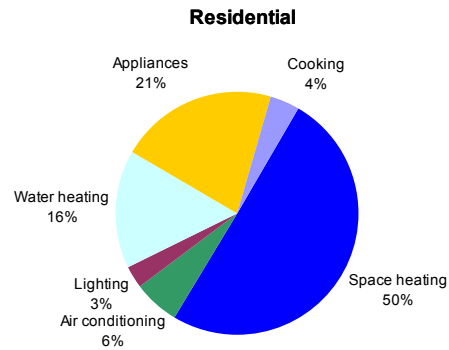
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Buildings & Appliances Savings Potentials, 2050 (World)



Savings = 587 Mtoe



Savings = 1 186 Mtoe

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Conclusions

- End-use efficiency is of key importance
- Appliances matter (electricity)
- Lighting matters (electricity)
- Space heating/cooling matters
- Water heating/cooling matters
- Heavy industry matters (metals, chemicals, ceramics pulp & paper)
- Systems matter
 - ◆ motor systems (electricity)
 - ◆ steam systems
 - ◆ process integration
 - ◆ life cycle issues

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Thank You

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