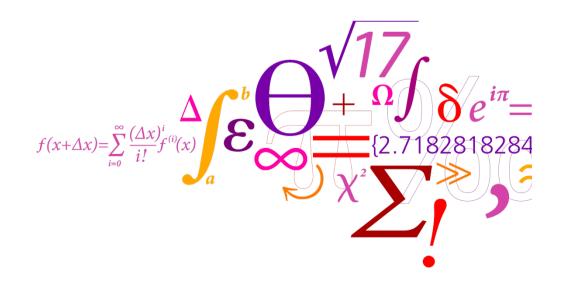


Household Classification According To Electricity Consumption

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Household electricity

- Consumption for building performance Fixed appliances
 - Space heating, hot water, cooling, ventilation
 - Regulated through Energy Performance of Buildings Directive
- Consumption for other services **Movable appliances**
 - Lighting, plug-in units, etc.
 - Unregulated but labelling exists for some appliances
- Average electricity use in Danish households 2000 kWh/person
- Average fixed electricity use in Danish households 400 kWh/person
- Fixed electricity in Danish low energy house 600 kWh for 140 m²



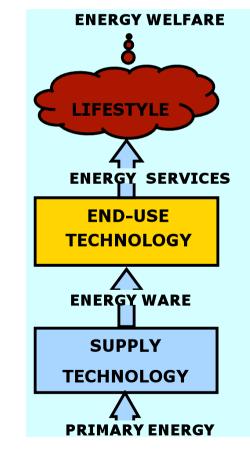
Imagine you have only

250 kWh electricity per person per year

for movable appliances

• Which energy services would you choose?

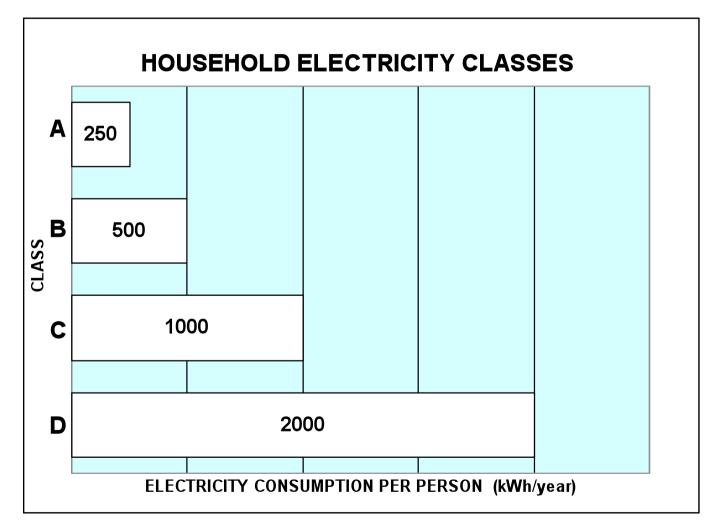
• How much energy welfare can you get?



Student projects

Household size, person	1	2	3	3	4	4	4
Food storage, kWh/year	62	190	190	303	186	172	124
Cleaning, kWh/year	51	116	152	125	156	277	175
Light, kWh/year	51	118	260	225	136	176	249
Home entertainment, kWh/year	55	92	93	85	90	104	362
Other, kWh/year	41	69	194	230	344	246	219
Total pr. person, kWh/(person year)	260	293	296	323	228	244	282

Scheme for classification



eceee summer study 5. June 2009

Class A household - 3 persons

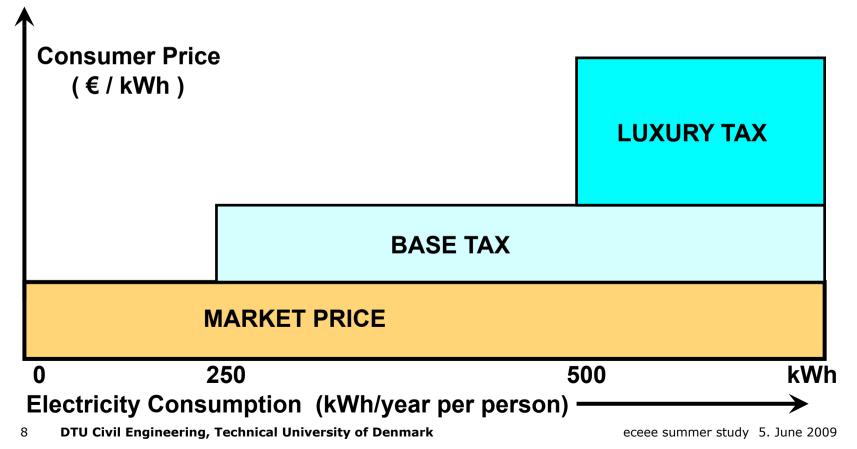
SERVICE TYPE	TECHNOLOGY	SERVICE LEVEL	INTENSITY	ELECTR. CONS. PER HOUSEH. (kWh/yr)	ELECTR. CONS. PER PERSON (kWh/yr)
Food storage	Refrigerator	200 L, + 5°C	0.45 kWh/(L yr)	90	30
Cooking	Oven	1 h/week, 180°C	1 kWh/h	52	17
	Kitchen hood	3 h/week	320 W	35	12
	Electric Kettle	2 L/day	0.12 kWh/L	88	29
Cleaning	Washing Mach. H+C	500 kg cloth./yr	0.04 kWh/kg	20	7
	Vacuum Cleaner	0.5 h/week	1800 W	48	16
	Clothes dryer	250 kg cloth./yr	0.27 kWh/kg	68	23
Entertainent	TV, 32"	2 h/day	140 W	102	34
	PC+Internet	2 h/day	22 W total	17	5
Illumination	10 CFL lamps	3 h/day	10 W each	110	37
Others				122	41
TOTAL	\rightarrow \rightarrow \rightarrow	$\rightarrow \rightarrow \rightarrow$	\rightarrow \rightarrow \rightarrow	750	250

Class B household – 3 persons

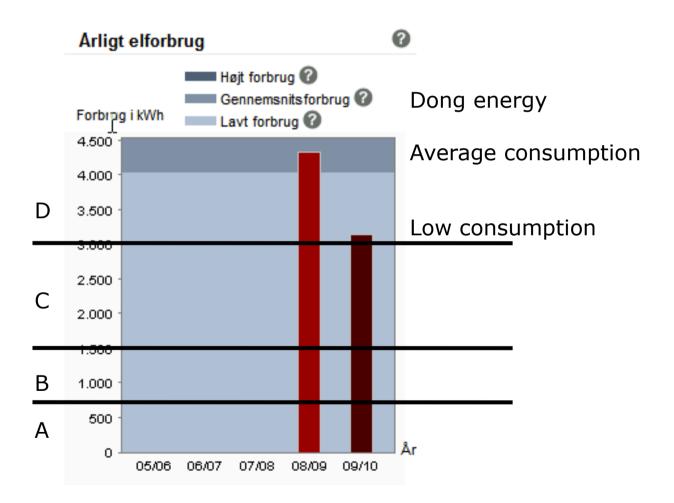
SERVICE TYPE	TECHNOLOGY	SERVICE LEVEL	INTENSITY	ELECTR. CONS. PER HOUSEH. (kWh/yr)	ELECTR. CONS. PER PERSON (kWh/yr)
Food storage	Refrigerator	200 L, + 5°C	0.45 kWh/(L yr)	90	30
	Freezer	100 L, -18°C	1.35 kWh/(L yr)	135	45
Cooking	Oven	2 h/week, 180°C	1 kWh/h	104	35
	Kitchen hood	5 h/week	320 W	59	20
	Electric Kettle	2 L/day	0.12 kWh/L	88	29
Cleaning	Washing Mach.	1000 kg cloth./yr	0.11 kWh/kg	110	37
	Vacuum Cleaner	0.5 h/week	1800 W	48	16
	Dishwasher H+C	4 cycle/week	0.75 kWh/cycle	156	52
	Clothes dryer	250 kg cloth./yr	0.27 kWh/kg	68	23
Entertainent	2 TV, 32"	2 h/day	280 W total	204	68
	PC+Internet	2 h/day	22 W total	36	15
	PC for games	1 h/day	100 W	37	12
Illumination	15 CFL lamps	3 h/day	10 W each	164	55
Others				203	68
TOTAL	$\rightarrow \rightarrow \rightarrow \rightarrow \rightarrow$	$\rightarrow \rightarrow \rightarrow$	\rightarrow \rightarrow \rightarrow	1500	500

Why use household classification ?

- Reduction target for private households
- Policies to reward or punish



Reduction target for private consumers





Conclusion

- It is possible to get good energy welfare at very low electricity consumption
- Using the bottom-up approach makes you wonder what a large part of the electricity is used for
- Classification of households could
 - Inspire the public to aim for a reduction target
 - Politicians can use the classes as criteria for various ways to reward or punish electricity consumers.