

Building Stock	<b>NL National</b>	Dutch non-profit housing	Year	2015
Details	Basic case - year 2015			

Annotations to this sheet

	1	2	3	4	5	6	7	8	9	10
Building type	SFHI	SFHII	SFHIII	SFHIV	SFHV	SFHVI	MFHI	MFHII		
Dataset	NL.Nationa I.2015.001. 01	NL.Nationa I.2015.001. 01	NL.Nationa I.2015.001. 01	NL.Nationa I.2015.001. 01	NL.Nationa I.2015.001. 01	NL.Nationa I.2015.001. 01	NL.Nationa I.2015.001. 01	NL.Nationa I.2015.001. 01		

## Thermal Envelope Average Building

Basic data	TABULA average buildings										
Floor area TABULA	<b>85,0</b>	<b>83,3</b>	<b>76,5</b>	<b>70,1</b>	<b>68,7</b>	<b>65,0</b>	<b>2446,0</b>	<b>2426,0</b>			m <sup>2</sup>
Floor area national	77,3	75,7	69,5	63,7	62,5	59,1	2223,6	2205,5			m <sup>2</sup>
Number of dwellings	1,00	1,00	1,00	1,00	1,00	1,00	0,91	0,91			

Thermal envelope areas (external dimensions)	TABULA average buildings										
Roof	111,3	77,1	81,3	62,2	78,8	58,6	729,1	586,6			m <sup>2</sup>
Wall	135,4	91,3	104,3	82,5	89,1	69,9	992,4	639,6			m <sup>2</sup>
Window	39,1	19,1	21,9	17,5	19,1	17,2	698,6	703,1			m <sup>2</sup>
Floor	77,3	75,7	69,5	63,7	62,5	59,1	729,1	586,6			m <sup>2</sup>

### Original state / not refurbished fraction of the envelope area

U-values of the original state	Building stock model - state indicators										
Roof	0,37	0,89	0,35	1,11	0,37	0,88	0,39	0,73			W/(m <sup>2</sup> K)
Wall	0,39	0,83	0,39	0,95	0,39	0,85	0,41	0,93			W/(m <sup>2</sup> K)
Window	2,54	3,16	2,09	3,03	2,53	3,04	2,22	2,86			W/(m <sup>2</sup> K)
Floor	0,39	1,72	0,43	2,49	0,40	1,66	0,42	1,35			W/(m <sup>2</sup> K)

### Refurbishments (averages)

Refurbished fraction of envelope areas	Building stock model - state indicators										
Roof		47%		19%	0%	13%		8%			
Wall	1%	2%			3%	0%	3%	0%			
Window	0%	2%		1%		3%	0%	1%			
Floor	43%	28%		8%	6%	8%	5%	3%			
<i>Total (indicative)</i>	<i>9%</i>	<i>23%</i>		<i>8%</i>	<i>3%</i>	<i>7%</i>	<i>2%</i>	<i>3%</i>			

U-values of the refurbished fraction (averages)	Building stock model - state indicators										
Roof		0,22		0,23	0,16	0,22		0,21			W/(m <sup>2</sup> K)
Wall	0,16	0,21			0,16	0,21	0,17	0,22			W/(m <sup>2</sup> K)
Window	1,80	1,80		1,80		1,80	1,80	1,80			W/(m <sup>2</sup> K)
Floor	0,16	0,25		0,26	0,17	0,24	0,17	0,24			W/(m <sup>2</sup> K)

## Energy Need for Heating TABULA

### Utilisation

	TABULA standard calculation procedure										
Utilisation dataset	EU.MUH	EU.MUH	EU.MUH	EU.MUH	EU.MUH	EU.MUH	EU.MUH	EU.MUH			
Internal temperature	20,0	20,0	20,0	20,0	20,0	20,0	20,0	20,0			°C
Reduction factor temp.	0,90	0,89	0,93	0,86	0,92	0,88	0,95	0,94			
Air exchange rate (use)	0,40	0,40	0,40	0,40	0,40	0,40	0,40	0,40			1/h
Internal heat sources	3,00	3,00	3,00	3,00	3,00	3,00	3,00	3,00			W/m <sup>2</sup>
Red. factor ext. shading	0,60	0,60	0,60	0,60	0,60	0,60	0,60	0,60			
Energy need for DHW	15,0	15,0	15,0	15,0	15,0	15,0	15,0	15,0			kWh/(m <sup>2</sup> a)

### Climate

	TABULA standard calculation procedure										
Climate dataset	Netherland s	Netherland s	Netherland s	Netherland s	Netherland s	Netherland s	Netherland s	Netherland s			
Base temperature	12,0	12,0	12,0	12,0	12,0	12,0	12,0	12,0			°C
Length of heating season	212	212	212	212	212	212	212	212			d/a
External temp. during HS	6,6	6,6	6,6	6,6	6,6	6,6	6,6	6,6			
Accum. temp. diff. ext. to int. temp.	2841	2841	2841	2841	2841	2841	2841	2841			Kd/a

### Envelope

	TABULA standard calculation procedure										
Heat transfer by transmission	204	228	129	263	124	203	2369	3276			W/K
related to surface area	0,56	0,87	0,47	1,17	0,50	0,99	0,75	1,30			W/(m <sup>2</sup> K)
related to ref. floor area	2,40	2,74	1,69	3,76	1,80	3,12	0,97	1,35			W/(m <sup>2</sup> K)

### Annual energy balance building

	TABULA standard calculation procedure										
Transmission heat losses	147,8	166,8	106,9	219,7	113,1	187,1	62,9	86,4			kWh/(m <sup>2</sup> a)
Ventilation heat losses	26,2	25,8	26,9	24,9	26,8	25,5	27,6	27,2			kWh/(m <sup>2</sup> a)
Usable solar gains	-22,2	-11,6	-14,2	-12,6	-13,9	-13,3	-12,5	-13,7			kWh/(m <sup>2</sup> a)
Usable internal gains	-13,5	-14,1	-13,9	-14,1	-14,0	-14,1	-14,0	-14,0			kWh/(m <sup>2</sup> a)
Energy need for heating	138,2	166,9	105,6	217,9	112,0	185,2	64,1	85,9			kWh/(m <sup>2</sup> a)
recovered by vent. system											kWh/(m <sup>2</sup> a)
Net energy need for heating	138,2	166,9	105,6	217,9	112,0	185,2	64,1	85,9			kWh/(m <sup>2</sup> a)

Building Stock	<b>NL National</b>	Dutch non-profit housing	Year	2015
Details	Basic case - year 2015			

Annotations to this sheet

	1	2	3	4	5	6	7	8	9	10
Building type	SFHI	SFHII	SFHIII	SFHIV	SFHV	SFHVI	MFHI	MFHII		

### Total Building Stock

	Building stock model - state indicators										Total	
Number of buildings	10 <sup>0</sup>	7 529	3 142	59 011	6 149	832 291	111 317	27 691	2 065			1 049 195
Number of dwellings	10 <sup>0</sup>	7 529	3 142	59 011	6 149	832 291	111 317	25 174	1 877			1 046 490
Floor area national	10 <sup>6</sup> m <sup>2</sup>	1	0	4	0	52	7	62	5			130
Floor area TABULA	10 <sup>6</sup> m <sup>2</sup>	1	0	5	0	57	7	68	5			143

### Ventilation Systems with Heat Recovery

	Building stock model - state indicators									
Occurrences	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%

### Heating Systems

#### Occurrences or Fractions of Produced Heat

	Building stock model - state indicators												
1	Gas	B_NC_CT	C	12%	22%	4%	14%	13%	18%	21%	24%		
2	Gas	B_C	C	82%	52%	94%	80%	74%	75%	68%	63%		
3	El	HP_Air	C	6%	10%	2%		13%	3%	10%	9%		
4	Gas	Other	D		16%	0%	6%	0%	4%	0%	3%		
5	El	Other	D		0%					0%	0%		
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
Sum				100%	100%	100%	100%	100%	100%	100%	100%		
thereof central				100%	84%	100%	94%	100%	96%	100%	97%		
decentral					16%	0%	6%	0%	4%	0%	3%		
Other Systems					0%	0%	0%	0%	0%	0%	0%		

### DHW Systems

#### Occurrences or Fractions of Produced Heat

	Building stock model - state indicators												
1	Gas	B_NC_CT	C	12%	14%	4%	12%	23%	16%	20%	19%		
2	Gas	B_C	C	81%	77%	94%	79%	66%	47%	67%	51%		
3	Gas	G_IWH_NC	D	1%	8%	0%	9%	1%	7%	2%	14%		
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
Sum				94%	99%	98%	100%	89%	70%	89%	83%		
thereof central				93%	91%	98%	91%	89%	63%	87%	70%		
decentral				1%	8%	0%	9%	1%	7%	2%	14%		
Other Systems				6%	1%	2%	0%	11%	30%	11%	17%		



# Average Buildings Delivered Energy for Space Heating

Building Stock	<b>NL National</b>	Dutch non-profit housing	Year	2015
Details	Basic case - year 2015			

Annotations to this sheet

	1	2	3	4	5	6	7	8	9	10
Building type	SFHI	SFHII	SFHIII	SFHIV	SFHV	SFIVI	MFHI	MFHII		

## Heating Systems

### Heat demand / heat generation

TABULA standard calculation procedure

Energy need for heating	138,2	166,9	105,6	217,9	112,0	185,2	64,1	85,9			kWh/(m <sup>2</sup> a)
Net en. need for heating	138,2	166,9	105,6	217,9	112,0	185,2	64,1	85,9			kWh/(m <sup>2</sup> a)

### Distribution + storage losses

TABULA system indicators

Central systems	C	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5			kWh/(m <sup>2</sup> a)
Decentral systems	D											kWh/(m <sup>2</sup> a)

### Auxiliary energy

TABULA system indicators

Ventil. systems (average)												kWh/(m <sup>2</sup> a)
Central systems	C	2,8	2,8	2,8	2,8	2,8	2,8	2,8	2,8			kWh/(m <sup>2</sup> a)
Decentral systems	D											kWh/(m <sup>2</sup> a)

### Energy expenditure factors (fuels: related to gross calorific value)

TABULA system indicators

1	Gas	B NC CT	C	1,33	1,33	1,33	1,33	1,33	1,33	1,33	1,33		
2	Gas	B C	C	1,05	1,05	1,05	1,05	1,05	1,05	1,05	1,05		
3	El	HP Air	C	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30		
4	Gas	Other	D	1,54	1,54	1,54	1,54	1,54	1,54	1,54	1,54		
5	El	Other	D	1,54	1,54	1,54	1,54	1,54	1,54	1,54	1,54		
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7													
8													
9													
10													
11													
12													
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14													
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19													
20													

### Delivered Energy

TABULA standard calculation procedure

1	Gas	B NC CT	C	193,0	231,1	149,4	299,2	158,1	255,6	94,1	123,3			kWh/(m <sup>2</sup> a)
2	Gas	B C	C	152,3	182,5	118,0	236,2	124,8	201,8	74,3	97,3			kWh/(m <sup>2</sup> a)
3	El	HP Air	C	43,4	52,0	33,6	67,3	35,6	57,5	21,2	27,7			kWh/(m <sup>2</sup> a)
4	Gas	Other	D	212,7	256,7	162,4	335,2	172,4	285,0	98,5	132,2			kWh/(m <sup>2</sup> a)
5	El	Other	D	212,7	256,7	162,4	335,2	172,4	285,0	98,5	132,2			kWh/(m <sup>2</sup> a)
6														kWh/(m <sup>2</sup> a)
7														kWh/(m <sup>2</sup> a)
8														kWh/(m <sup>2</sup> a)
9														kWh/(m <sup>2</sup> a)
10														kWh/(m <sup>2</sup> a)
11														kWh/(m <sup>2</sup> a)
12														kWh/(m <sup>2</sup> a)
13														kWh/(m <sup>2</sup> a)
14														kWh/(m <sup>2</sup> a)
15														kWh/(m <sup>2</sup> a)
16														kWh/(m <sup>2</sup> a)
17														kWh/(m <sup>2</sup> a)
18														kWh/(m <sup>2</sup> a)
19														kWh/(m <sup>2</sup> a)
20														kWh/(m <sup>2</sup> a)

### Delivered Energy - weighted by frequencies

TABULA standard calculation procedure

1	Gas	B NC CT	C	22,2	51,5	5,5	41,9	21,1	46,4	19,9	30,0			kWh/(m <sup>2</sup> a)
2	Gas	B C	C	125,0	94,4	111,3	188,3	92,5	151,7	50,8	61,4			kWh/(m <sup>2</sup> a)
3	El	HP Air	C	2,8	5,2	0,6		4,4	1,5	2,2	2,6			kWh/(m <sup>2</sup> a)
4	Gas	Other	D		40,8	0,3	20,9	0,1	11,4	0,2	4,4			kWh/(m <sup>2</sup> a)
5	El	Other	D		0,1					0,0	0,1			kWh/(m <sup>2</sup> a)
6														kWh/(m <sup>2</sup> a)
7														kWh/(m <sup>2</sup> a)
8														kWh/(m <sup>2</sup> a)
9														kWh/(m <sup>2</sup> a)
10														kWh/(m <sup>2</sup> a)
11														kWh/(m <sup>2</sup> a)
12														kWh/(m <sup>2</sup> a)
13														kWh/(m <sup>2</sup> a)
14														kWh/(m <sup>2</sup> a)
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17														kWh/(m <sup>2</sup> a)
18														kWh/(m <sup>2</sup> a)
19														kWh/(m <sup>2</sup> a)
20														kWh/(m <sup>2</sup> a)

### Electricity production by CHP

TABULA standard calculation procedure

														kWh/(m <sup>2</sup> a)
														kWh/(m <sup>2</sup> a)
														kWh/(m <sup>2</sup> a)
														kWh/(m <sup>2</sup> a)



Building Stock	<b>NL National</b>	Dutch non-profit housing	Year	2015
Details	Basic case - year 2015			

Annotations to this sheet

	1	2	3	4	5	6	7	8	9	10
Building type	SFHI	SFHII	SFHIII	SFHIV	SFHV	SFHVI	MFHI	MFHII		

DHW Systems

<b>Heat demand / heat generation</b>											TABULA standard calculation procedure	
Energy need for DHW	15,0	15,0	15,0	15,0	15,0	15,0	15,0	15,0	15,0			kWh/(m <sup>2</sup> a)
Distribution + storage losses											TABULA system indicators	
Central systems	C	7,8	7,8	7,8	7,8	7,8	7,8	7,8	7,8			kWh/(m <sup>2</sup> a)
Decentral systems	D	3,1	3,1	3,1	3,1	3,1	3,1	3,1	3,1			kWh/(m <sup>2</sup> a)
Auxiliary energy											TABULA system indicators	
Central systems	C											kWh/(m <sup>2</sup> a)
Decentral systems	D											kWh/(m <sup>2</sup> a)

<b>Energy expenditure factors</b> (fuels: related to gross calorific value)											TABULA system indicators	
1	Gas	B NC CT	C	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	
2	Gas	B C	C	1,11	1,11	1,11	1,11	1,11	1,11	1,11	1,11	
3	Gas	G IWH NC	D	1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30	
4												
5												
6												
7												
8												
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19												
20												

<b>Delivered Energy</b>											TABULA standard calculation procedure	
1	Gas	B NC CT	C	29,6	29,6	29,6	29,6	29,6	29,6	29,6	29,6	kWh/(m <sup>2</sup> a)
2	Gas	B C	C	25,3	25,3	25,3	25,3	25,3	25,3	25,3	25,3	kWh/(m <sup>2</sup> a)
3	Gas	G IWH NC	D	23,5	23,5	23,5	23,5	23,5	23,5	23,5	23,5	kWh/(m <sup>2</sup> a)
4												kWh/(m <sup>2</sup> a)
5												kWh/(m <sup>2</sup> a)
6												kWh/(m <sup>2</sup> a)
7												kWh/(m <sup>2</sup> a)
8												kWh/(m <sup>2</sup> a)
9												kWh/(m <sup>2</sup> a)
10												kWh/(m <sup>2</sup> a)
11												kWh/(m <sup>2</sup> a)
12												kWh/(m <sup>2</sup> a)
13												kWh/(m <sup>2</sup> a)
14												kWh/(m <sup>2</sup> a)
15												kWh/(m <sup>2</sup> a)
16												kWh/(m <sup>2</sup> a)
17												kWh/(m <sup>2</sup> a)
18												kWh/(m <sup>2</sup> a)
19												kWh/(m <sup>2</sup> a)
20												kWh/(m <sup>2</sup> a)

<b>Delivered Energy - weighted by frequencies</b>											TABULA standard calculation procedure	
1	Gas	B NC CT	C	3,5	4,2	1,2	3,4	6,7	4,6	6,0	5,5	kWh/(m <sup>2</sup> a)
2	Gas	B C	C	20,5	19,5	23,8	20,0	16,7	12,0	16,9	12,9	kWh/(m <sup>2</sup> a)
3	Gas	G IWH NC	D	0,3	1,9	0,0	2,2	0,1	1,7	0,5	3,2	kWh/(m <sup>2</sup> a)
4												kWh/(m <sup>2</sup> a)
5												kWh/(m <sup>2</sup> a)
6												kWh/(m <sup>2</sup> a)
7												kWh/(m <sup>2</sup> a)
8												kWh/(m <sup>2</sup> a)
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16												kWh/(m <sup>2</sup> a)
17												kWh/(m <sup>2</sup> a)
18												kWh/(m <sup>2</sup> a)
19												kWh/(m <sup>2</sup> a)
20												kWh/(m <sup>2</sup> a)

<b>Electricity production by CHP</b>											TABULA standard calculation procedure	
												kWh/(m <sup>2</sup> a)
												kWh/(m <sup>2</sup> a)
												kWh/(m <sup>2</sup> a)
												kWh/(m <sup>2</sup> a)



# Average Buildings EPISCOPE Simplified Building Stock Projection

Building Stock **NL National** Dutch non-profit housing Year 2015  
 Details Basic case - year 2015

Annotations to this sheet

## Total Building Stock

	1	2	3	4	5	6	7	8	9	10	Total	
Building type	SFHI	SFHII	SFHIII	SFHIV	SFHV	SFHVI	MFHI	MFHII				
Floor area TABULA	10 <sup>6</sup> m <sup>2</sup>	1	0	5	0	57	7	68	5	0	0	143

All energy quantities in **GWh/a**

## Heating Systems

Heat Demand for Heating	TABULA standard calculation procedure / projection to building stock										Total
Energy need for heating	88	44	477	94	6 410	1 341	4 338	430			13 223
Net en. need for heating	88	44	477	94	6 410	1 341	4 338	430			13 223
Produced heat	93	45	506	97	6 782	1 386	4 778	462			14 148

Delivered Energy TABULA	TABULA standard calculation procedure / projection to building stock										Sum
1 Gas B_NC_CT C	14	13	25	18	1 205	336	1 346	150			3 106
2 Gas B_C C	80	25	502	81	5 291	1 098	3 441	307			10 826
3 El HP_Air C	2	1	3	0	254	11	147	13			431
4 Gas Other D	0	11	1	9	5	83	15	22			145
5 El Other D	0	0	0	0	0	0	1	0			1
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
Not specified systems	0	0	0	0	1	0	1	0			3
Auxiliary energy	2	1	13	1	160	19	189	14			398
CHP electr. production											0

## DHW Systems

Heat Demand for DHW	TABULA standard calculation procedure / projection to building stock										Total
Energy need for DHW	10	4	68	6	858	109	1 016	75			2 146
Produced heat	14	6	102	10	1 254	146	1 480	105			3 116

Delivered Energy TABULA	TABULA standard calculation procedure / projection to building stock										Total
1 Gas B_NC_CT C	2	1	5	1	382	33	408	28			861
2 Gas B_C C	13	5	107	9	957	87	1 143	65			2 385
3 Gas G_IWH_NC D	0	0	0	1	8	12	34	16			72
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
Not specified systems	1	0	1	0	93	33	111	12			251
Auxiliary energy	0	0	0	0	0	0	0	0			0
CHP electr. production											0

Building Stock **NL National** Dutch non-profit housing Year **2015**  
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Annotations to this sheet

Total Building Stock	1	2	3	4	5	6	7	8	9	10	Total	
Building type	SFHI	SFHII	SFHIII	SFHIV	SFHV	SFHVI	MFHI	MFHII				
Floor area TABULA	10 <sup>6</sup> m <sup>2</sup>	1	0	5	0	57	7	68	5	0	0	143

## Total Heat Need and Final Energy

All energy quantities in **GWh/a**

Heating + DHW

Simplified TABULA projection	fuels related to gross calorific value (TABULA standard)									TABULA standard calculation procedure projection to building stock		Total	per m <sup>2</sup>
Net heat need	98	48	544	100	7 268	1 450	5 354	506				15 369	107
Produced heat	107	51	608	106	8 036	1 532	6 257	566				17 264	121
Gas	110	56	641	119	7 847	1 648	6 386	588				17 395	122
Oil	0	0	0	0	0	0	0	0				0	0
Coal	0	0	0	0	0	0	0	0				0	0
Bio	0	0	0	0	0	0	0	0				0	0
DH	0	0	0	0	0	0	0	0				0	0
El (incl. aux. en.)	4	2	15	1	414	31	336	27				830	6
Other / not specified	1	0	1	0	94	33	112	12				254	2
Sum final energy	114	58	658	120	8 356	1 712	6 834	627	0	0		18 479	129
per m <sup>2</sup>	178	220	146	279	146	236	101	125					
CHP electr. production	0	0	0	0	0	0	0	0				0	0

## Separate individual model or total metered consumption

fuels related to **gross** calorific value

factors for conversion to gross calorific value (TABULA standard)

Individual building stock model

											Total	per m <sup>2</sup>
Net heat need	67	44	586	98	6 751	1 475	5 867	702			15 591	109
Produced heat	79	52	690	115	7 942	1 735	6 903	826			18 342	128
Gas	1,00	68	49	606	110	6 896	1 631	5 951	748		16 060	112
Oil	1,00	0	0	0	0	0	0	0			0	0
Coal	1,00	0	0	0	0	0	0	0			0	0
Bio	1,00	0	0	0	0	0	0	0			0	0
DH		0	0	0	0	0	0	0			0	0
El		11	3	83	5	1 046	104	952	785		2 988	21
Other / not specified		0	0	0	0	0	0	0			0	0
Sum final energy		79	52	690	115	7 942	1 735	6 903	1 532	0	19 048	133
per m <sup>2</sup>		124	198	153	268	139	240	102	306			
CHP electr. production		0	0	0	0	0	0	0			0	0

## Ratio of individual model or total metered consumption to simplified TABULA projection (TABULA balance calibration factors)

											Total
Net heat need	69%	93%	108%	98%	93%	102%	110%	139%			101%
Produced heat	74%	102%	113%	109%	99%	113%	110%	146%			106%
Gas	62%	88%	95%	93%	88%	99%	93%	127%			92%
Oil											
Coal											
Bio											
DH											
El	304%	146%	541%	433%	252%	341%	283%	2923%			360%
Other	0%	0%	0%	0%	0%	0%	0%	0%			0%
Sum final energy	70%	90%	105%	96%	95%	101%	101%	244%			103%
CHP electr. production											