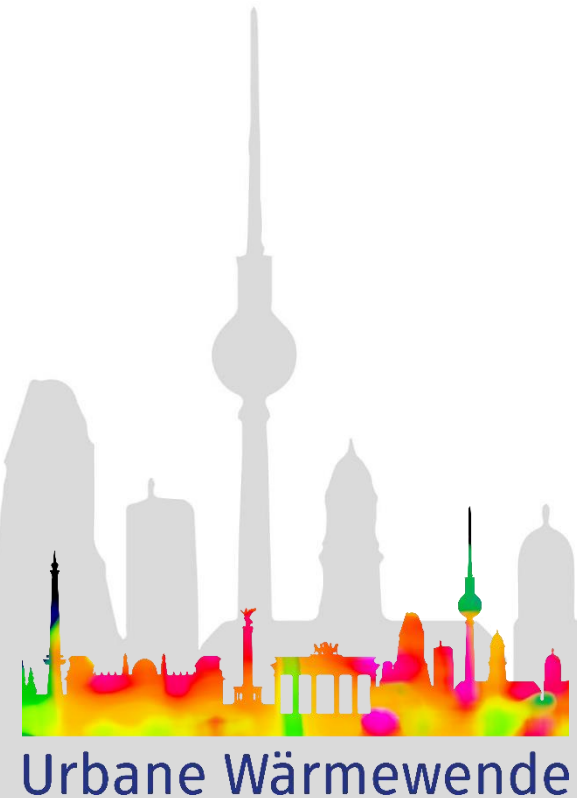


# Urban Heat Shift: Berlin

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10.11.2017, European Green Australian Summit



# Why heat?

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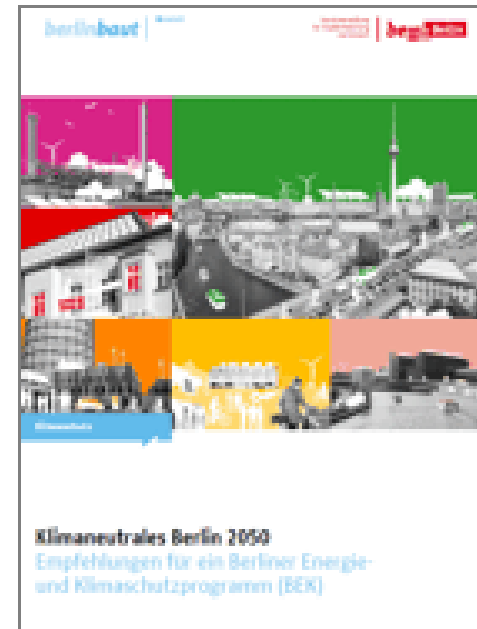


- CO<sub>2</sub>-Reduction target: -85% to -95%
- Relevance: 56%
- Renewables: 13,4 %
- Speed of change: <1%

# Why Berlin?



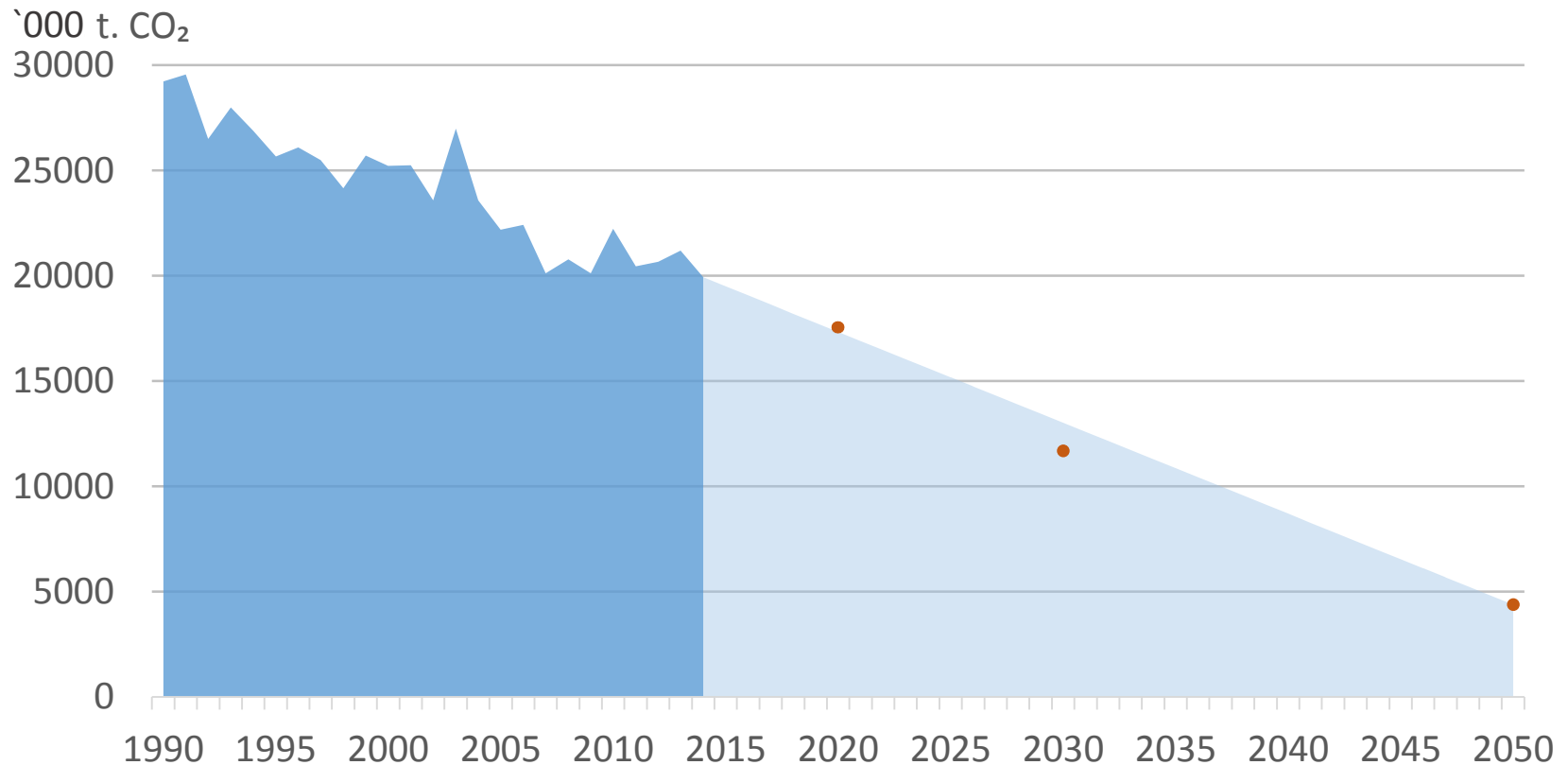
Urbane Wärmewende



# Where do we stand?



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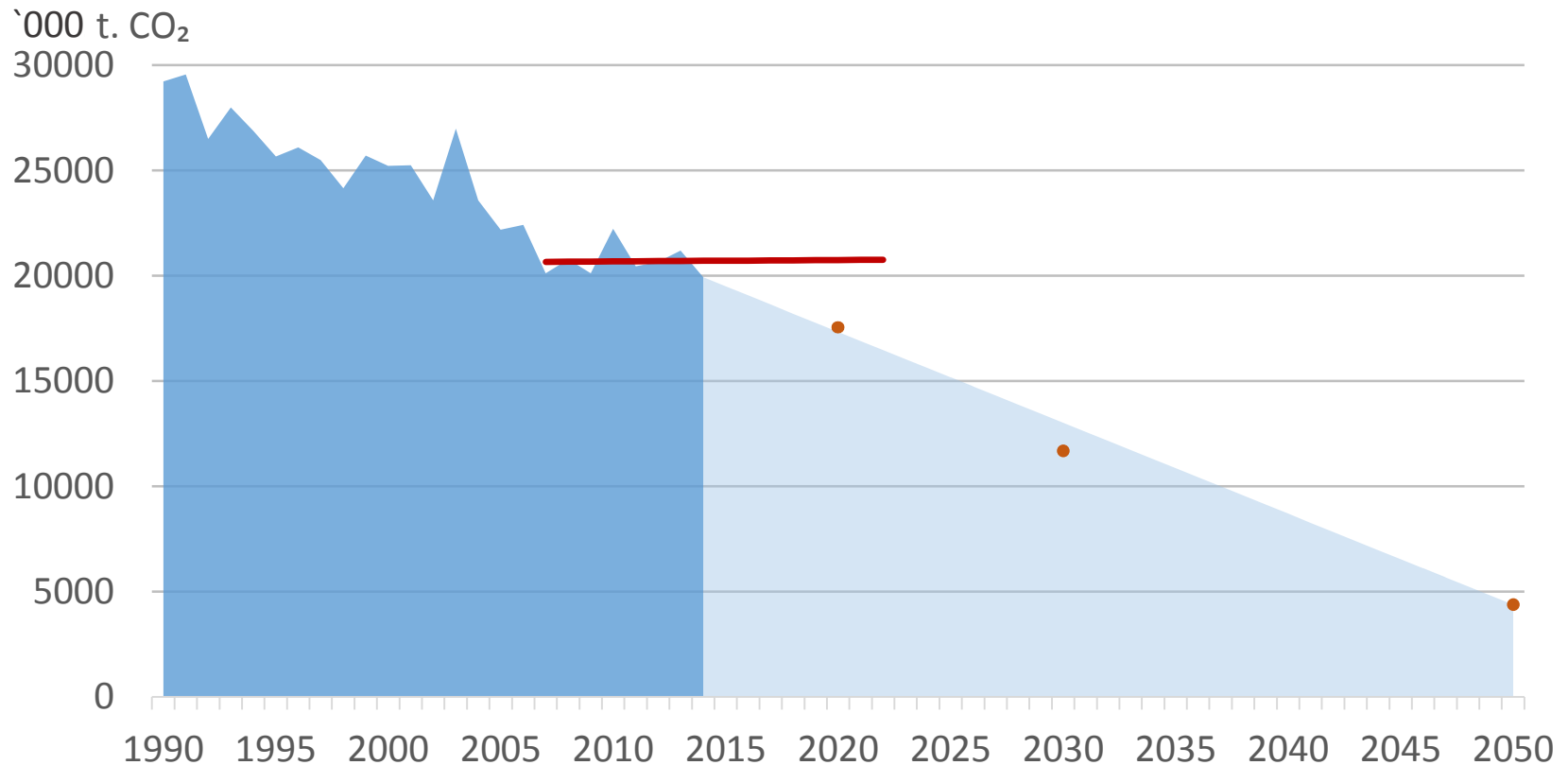


Source: own picture based on data from Amt für Statistik Berlin-Brandenburg

# Where do we stand?



Urbane Wärmewende



Source: own picture based on data from Amt für Statistik Berlin-Brandenburg

# Why is it so difficult?



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- Heterogeneity and complexity in the heat market
  - Many technologies and actors
  - No clear picture which options are the best
- Conditions and regulation
  - Fossil fuels have been very cheap lately
  - Complicated regulation
- Sozio-cultural aspects
  - Heat consumption causes significant costs for households
  - Increases in rents
  - Historic preservation
  - Living space per person is increasing: rebounds

# What are possible ways?



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There are different ways, here is one:

PJ/a	2012	2020	2025	2030	2050
heat-oil	32	18	8	3	0
heat-gas	77	63	52	36	8
heat-electricity	5	4	6	8	12
heat-heat pump	0,4	0,8	1,7	2,9	5,6
heat-biomass	1,1	1	1,5	1,7	2
heat solar	0,1	0,1	0,3	0,8	2,7
heat - district heating	42	43	44	44	33
<b>TOTAL heat</b>	<b>157,6</b>	<b>129,9</b>	<b>113,5</b>	<b>96,4</b>	<b>63,3</b>
PtDH	0	0	0	4	7
Share district heating	27%	33%	39%	46%	52%

Source: Hirschl et al. 2015: Entwurf für ein Berliner Energie- und Klimaschutzprogramm (BEK). Anhang B: ergänzende methodische Erläuterungen

# District heating



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2030	2050
<b>Cogeneration</b> <ul style="list-style-type: none"><li>- Flexible in production</li><li>- Phase-out from coal</li></ul>	<b>Cogeneration</b> <ul style="list-style-type: none"><li>- Based on green gas</li></ul>
<b>Power to heat</b> <ul style="list-style-type: none"><li>- Electrode boilers</li></ul>	<b>Power to heat</b> <ul style="list-style-type: none"><li>- Big heat pumps</li></ul>
<b>Heat stores</b>	<b>Heat stores</b>
<b>Integrating low temperature heat</b> <ul style="list-style-type: none"><li>- Solar heat</li></ul>	<b>Integrating low temperature heat</b> <ul style="list-style-type: none"><li>- Solar heat, geothermal heat</li><li>- Waste water, rivers</li><li>- Data centers...</li></ul>
<b>Heating system</b> <ul style="list-style-type: none"><li>- Radiators</li></ul>	<b>Heating system</b> <ul style="list-style-type: none"><li>- Panel heating</li></ul>



# What has to be done?



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- Transform the big district heating system in Berlin (2.000 km): climate protection agreement
- Use options for flexibility and interlinking sectors in urban areas
- Stimulate solar boom (PV is important for heat)
- Exploit potentials for efficiency and low temperature in the building stock (public properties, municipal housing....)
- Promote for better regulation at the federal level

# Thank you very much!

Dr. Elisa Dunkelberg

10.11.2017, Berlin

Information: <http://www.urbane-waermewende.de/english.html>



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