



## Strategic Approach

A global Strategic Approach to energy efficiency in the building sector



# Status Quo

- Buildings account for almost 30% of global CO<sub>2</sub> emissions
- Improving buildings and appliance energy efficiency has up to 80% - 90 % saving potentials
- Conventional new buildings in OECD countries save 50 % energy compared to stock



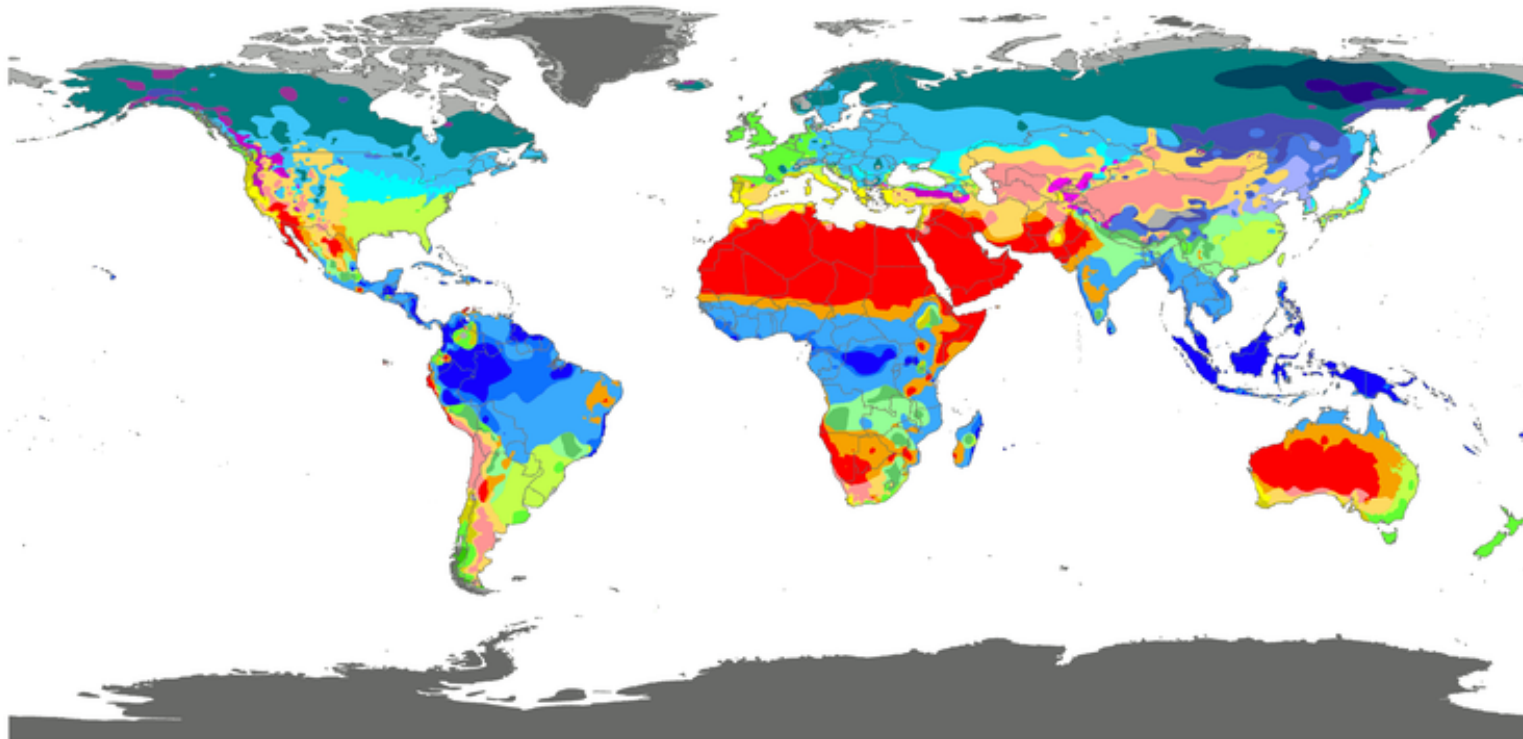
# Is a Strategic Approach needed?

- No worldwide consistent standard for primary thermal energy consumption
  - A general definition for low-energy buildings does not exist
  - Numerous definitions of net or nearly Zero Energy Buildings
- No definition that takes into account various levels of ambition
- Target definitions are often not clear



# Climate Zones

World map of Köppen-Geiger climate classification



Af	BWh	Csa	Cwa	Cfa	Dsa	Dwa	Dfa	ET
Am	BWk	Csb	Cwb	Cfb	Dsb	Dwb	Dfb	EF
Aw	BSH	Cwc	Cfc	Dsc	Dwc	Dfc		
	BSk			Dsd	Dwd	Dfd		

Contact : Murray C. Peel ([mpeel@unimelb.edu.au](mailto:mpeel@unimelb.edu.au)) for further information

**DATA SOURCE :** GHCN v2.0 station data  
Temperature (N = 4,844) and  
Precipitation (N = 12,396)

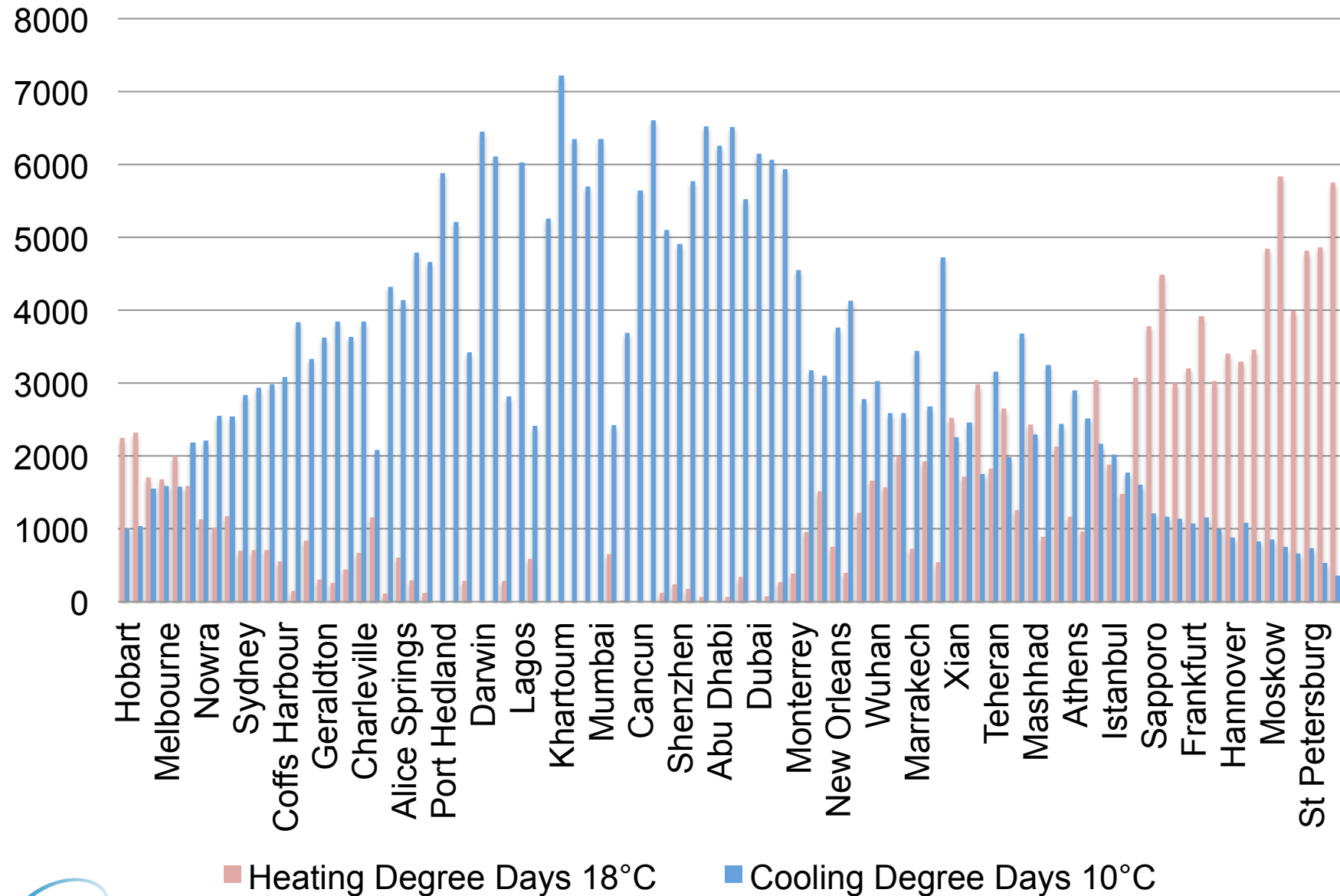
**PERIOD OF RECORD :** All available

**MIN LENGTH :** ≥30 for each month.

**RESOLUTION :** 0.1 degree lat/long



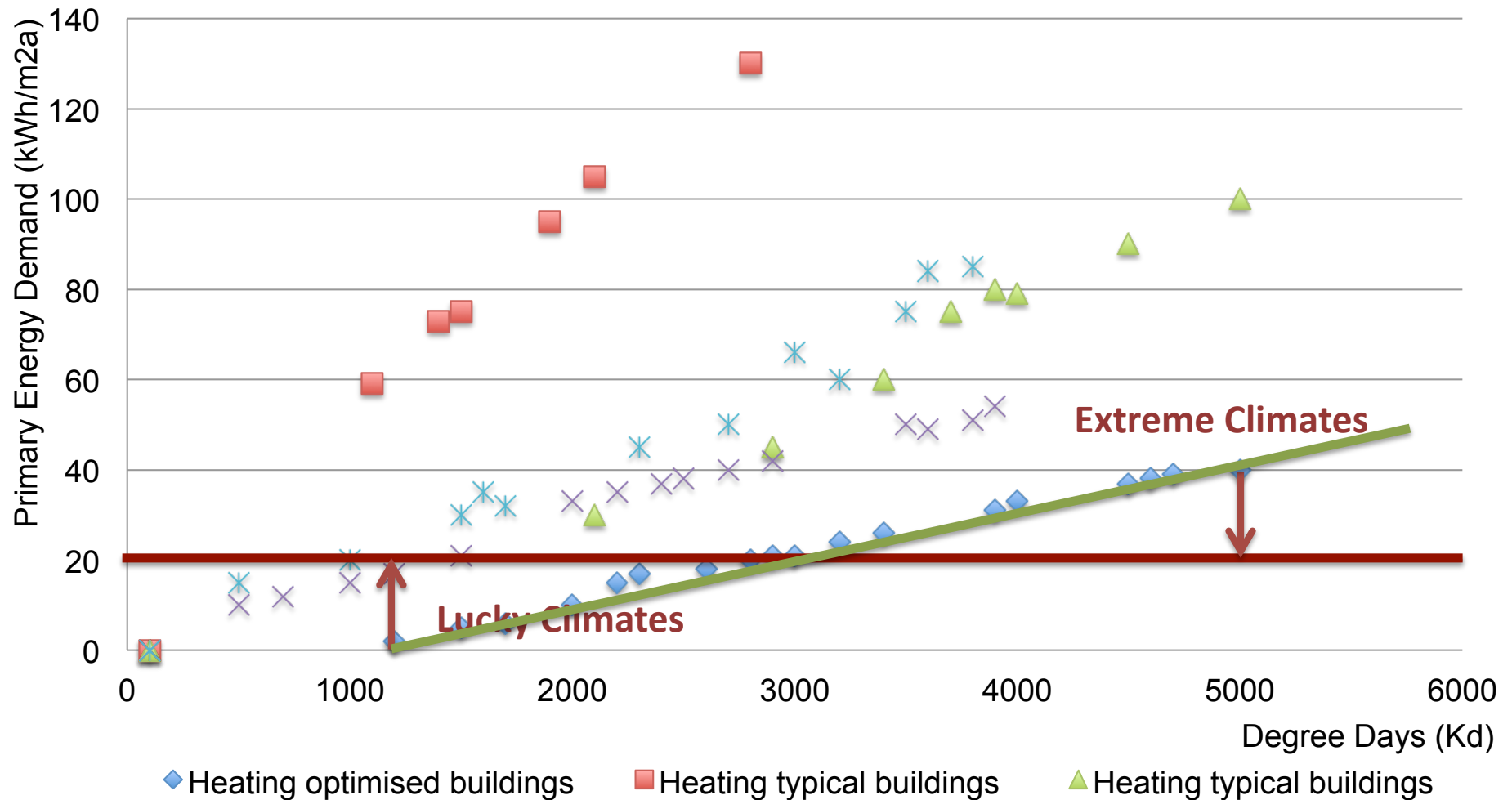
# Comparison of Degree Days





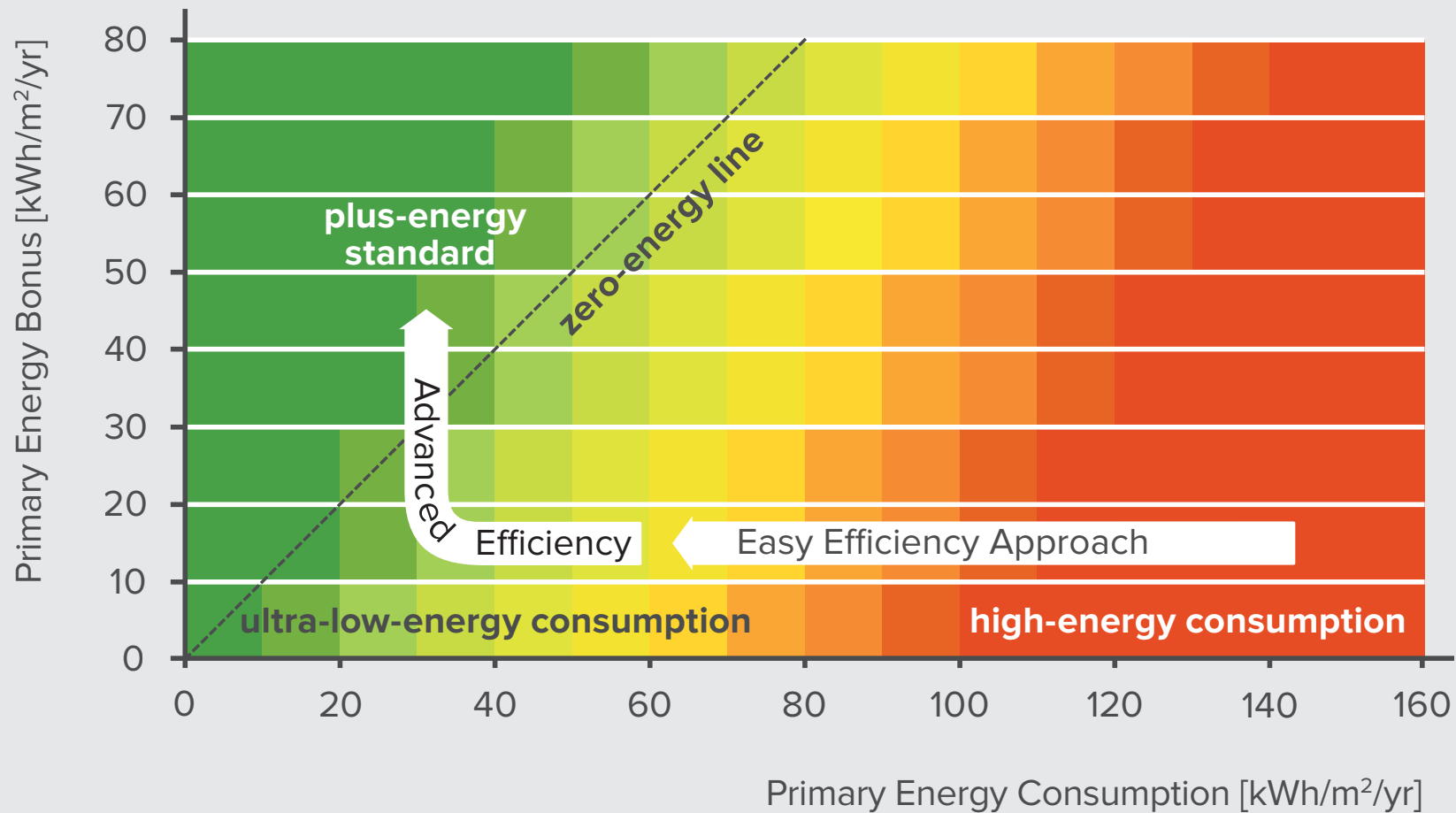
# Primary Energy per Degree Day

Comparison of annual Primary Energy consumption per Degree Day





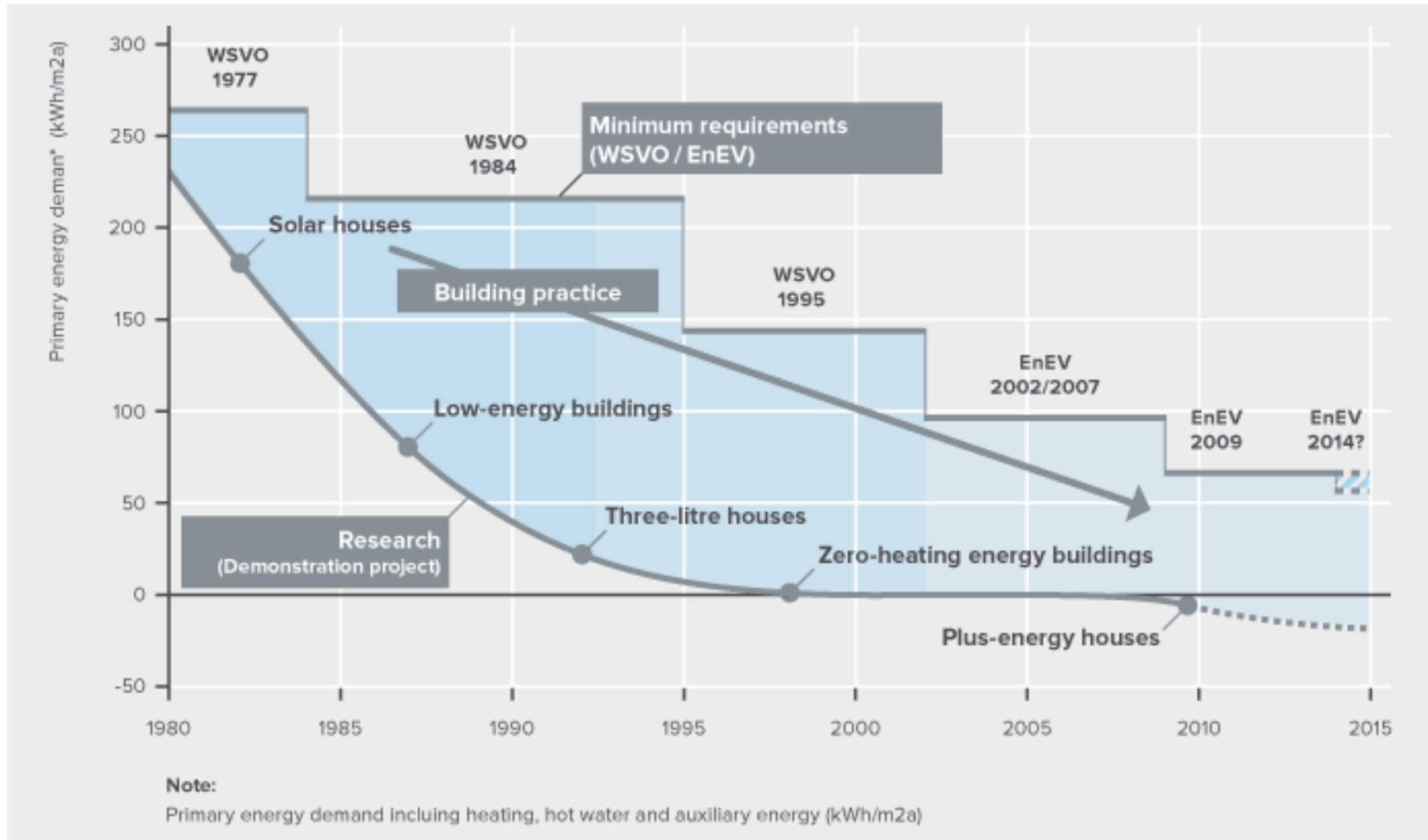
# The path to energy efficiency





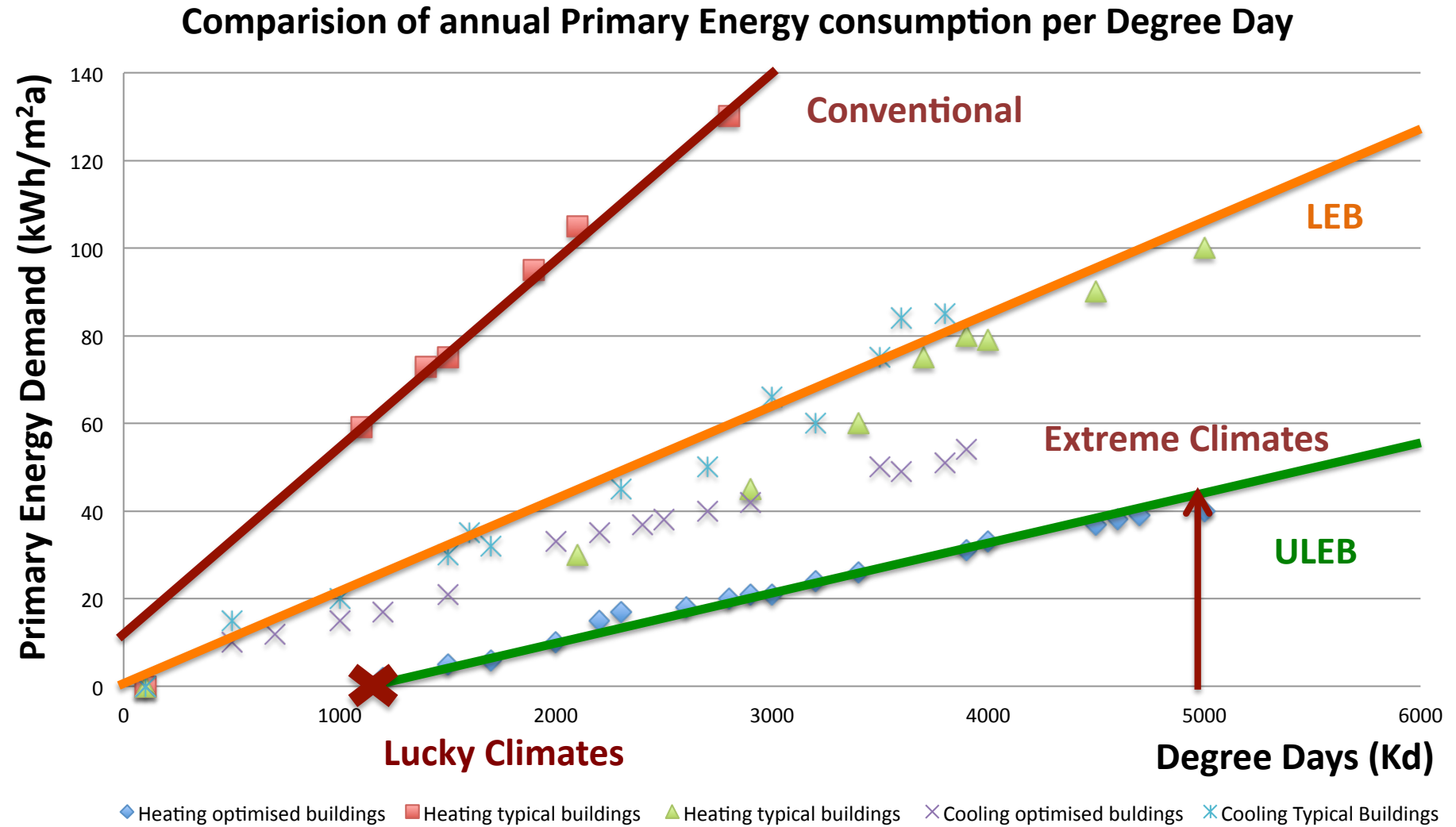
# Minimum Energy Performance Standards

Case study: new buildings in Germany



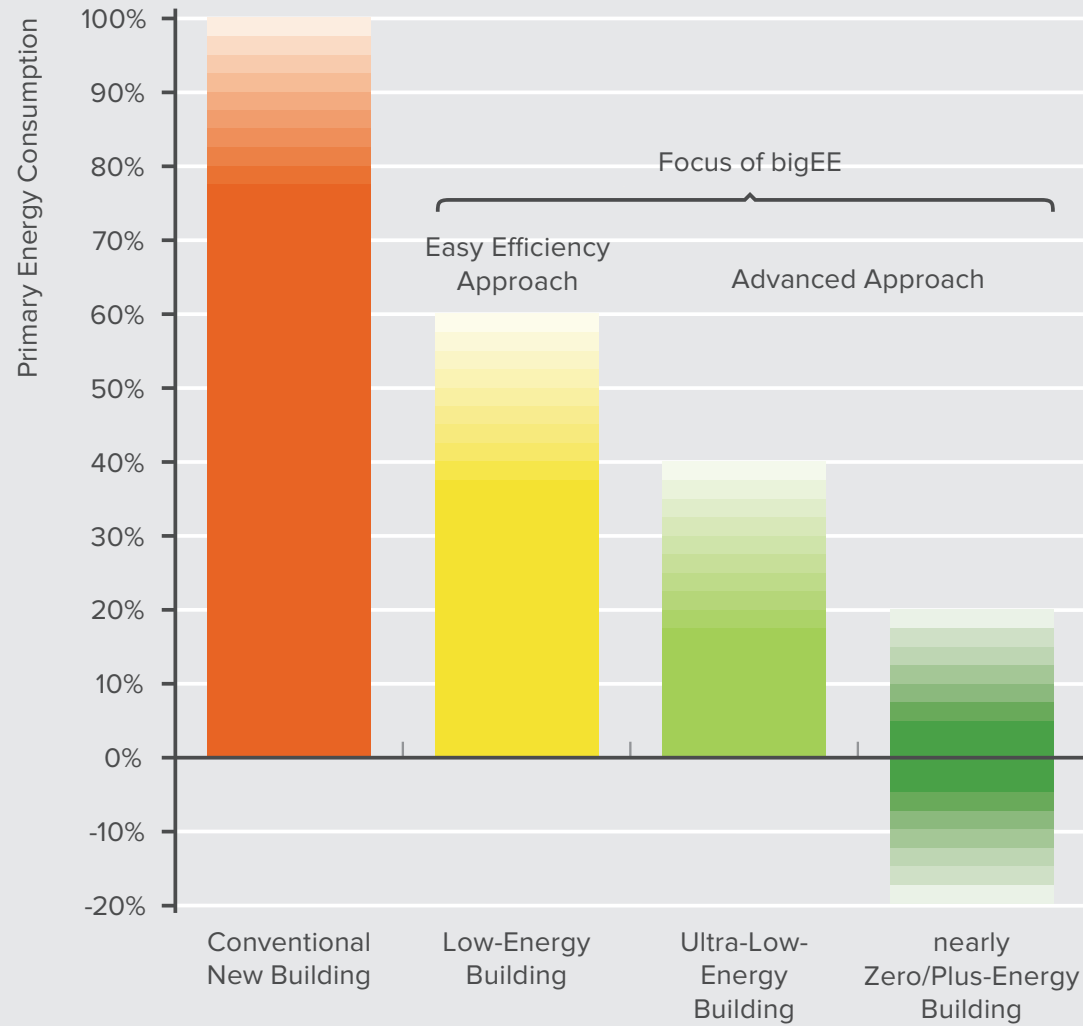


# Primary Energy per Degree Day



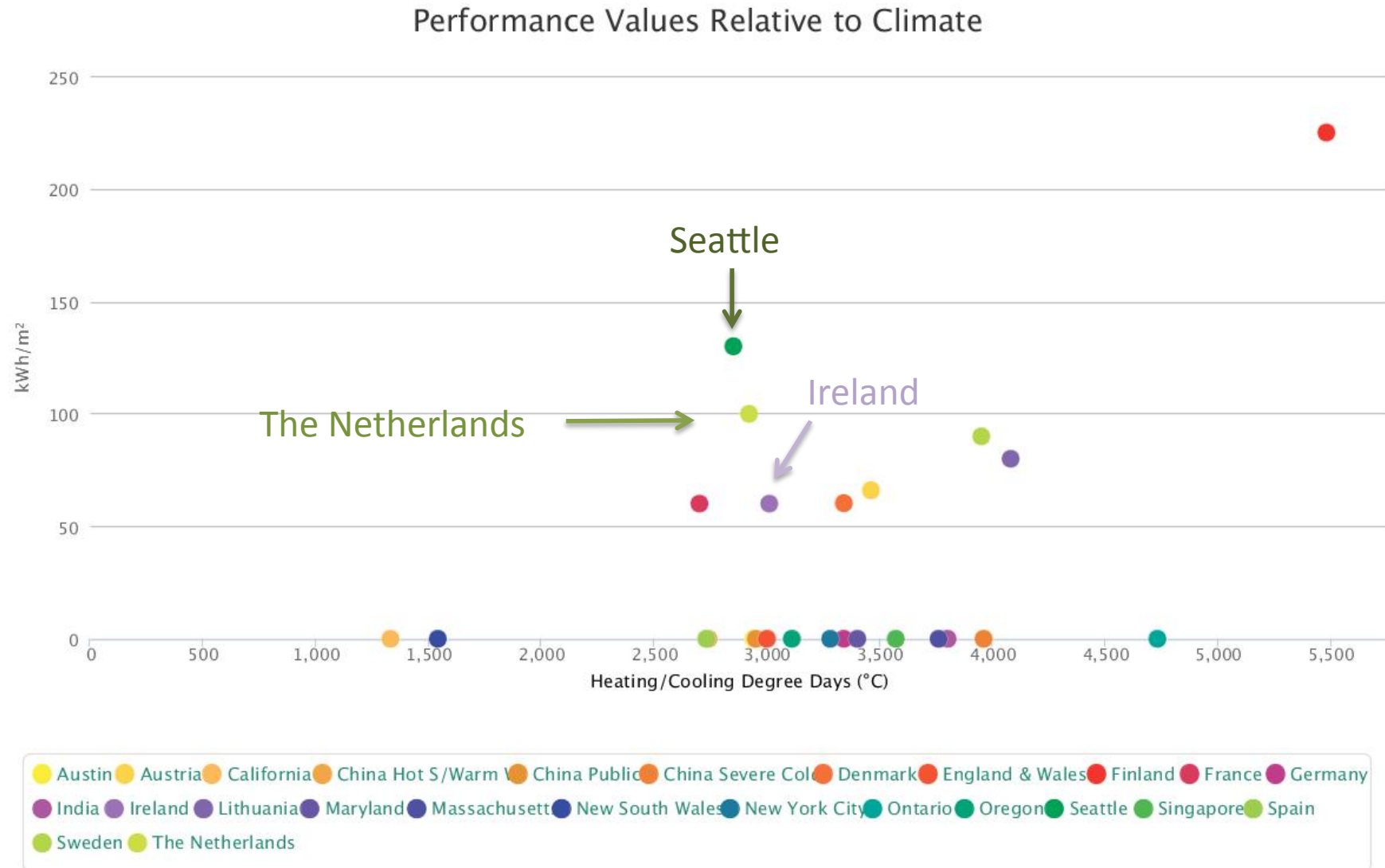


# The steps to energy efficiency





# Performance relative to climate



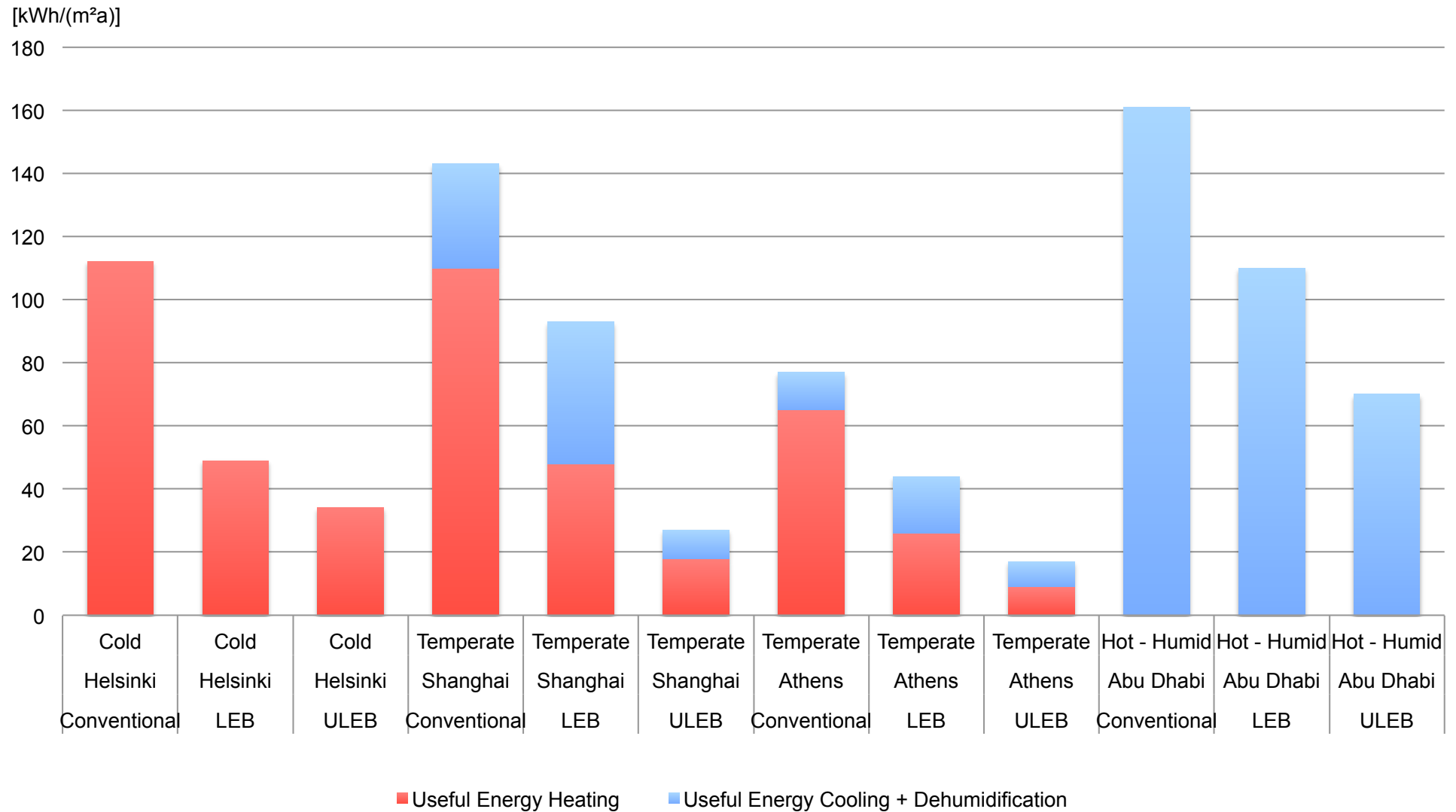
Source: GBPN

2013-02-11  
8



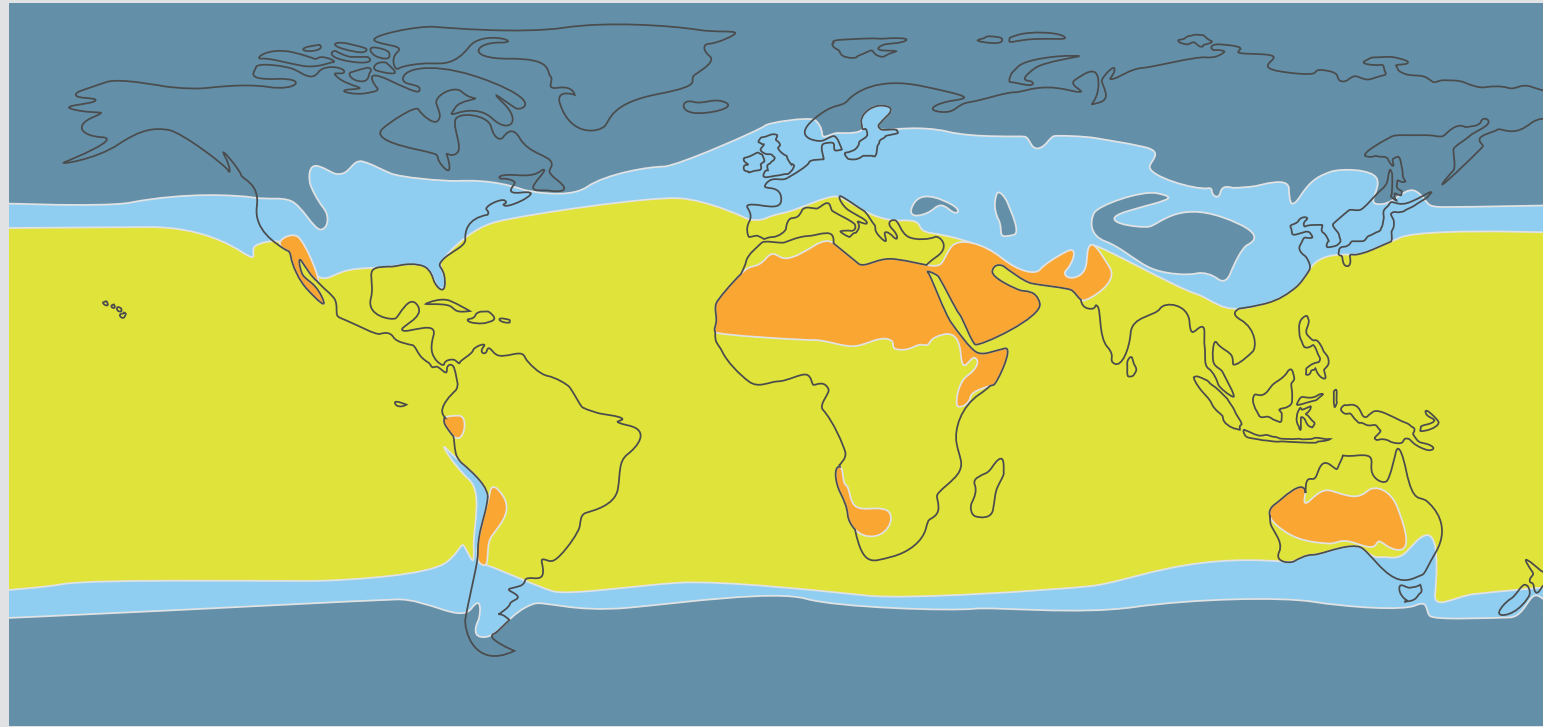
# Simulation results of buildings

(useful energy; simulations by ECOFYS and Wuppertal Institute)





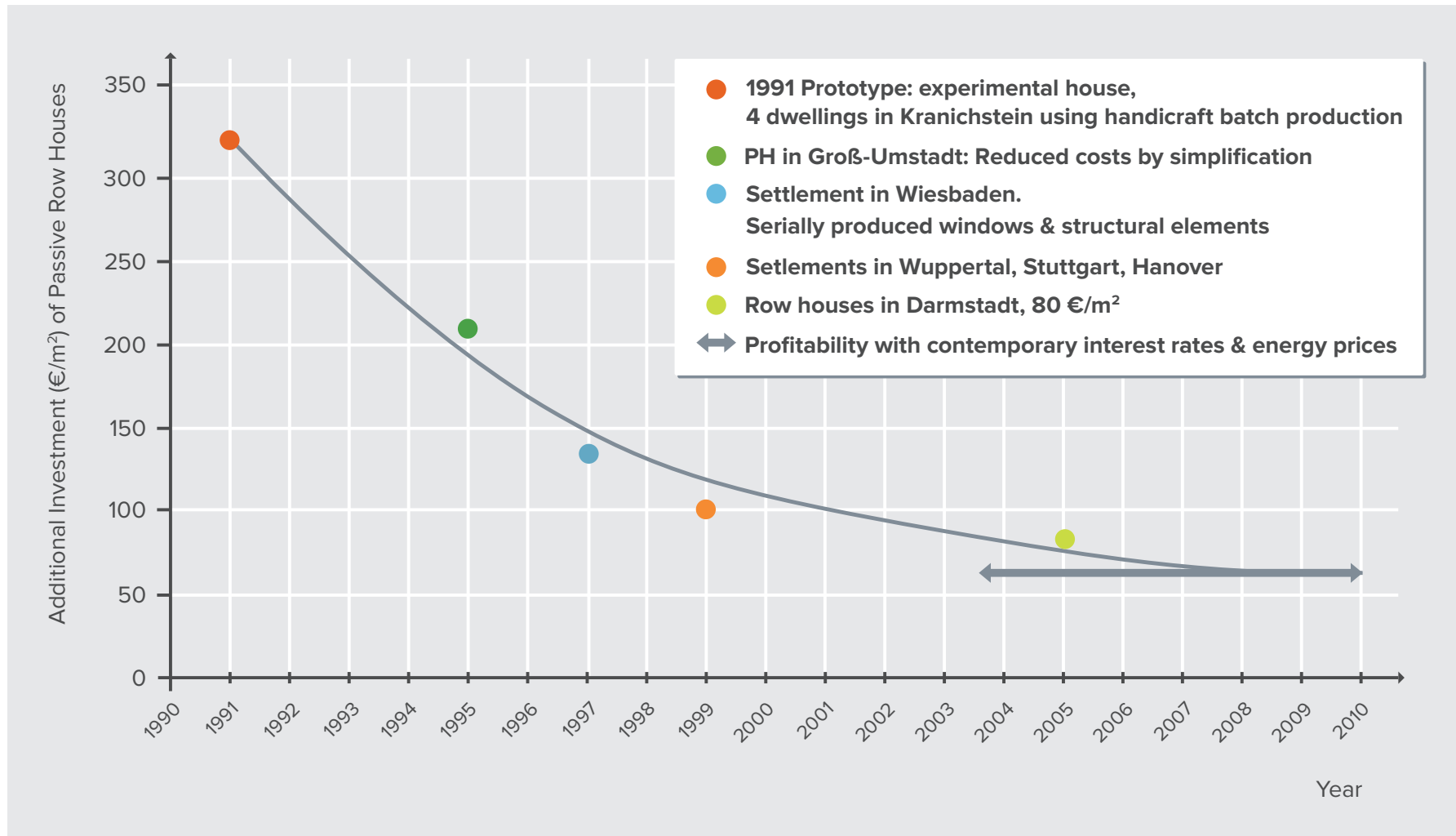
# bigEE Climate Zones



Climate	LEB	ULEB	nZEB	PEB
Cold	80-40 kWh/m <sup>2</sup> <sub>TFA</sub> yr	40-20 kWh/m <sup>2</sup> <sub>TFA</sub> yr	20-0 kWh/m <sup>2</sup> <sub>TFA</sub> yr	++
Temperate	80-40 kWh/m <sup>2</sup> <sub>TFA</sub> yr	40-20 kWh/m <sup>2</sup> <sub>TFA</sub> yr	20-0 kWh/m <sup>2</sup> <sub>TFA</sub> yr	++
Hot and Humid	150-100 kWh/m <sup>2</sup> <sub>TFA</sub> yr	100-50 kWh/m <sup>2</sup> <sub>TFA</sub> yr	50-0 kWh/m <sup>2</sup> <sub>TFA</sub> yr	++
Hot and Arid	100-50 kWh/m <sup>2</sup> <sub>TFA</sub> yr	50-25 kWh/m <sup>2</sup> <sub>TFA</sub> yr	25-0 kWh/m <sup>2</sup> <sub>TFA</sub> yr	++

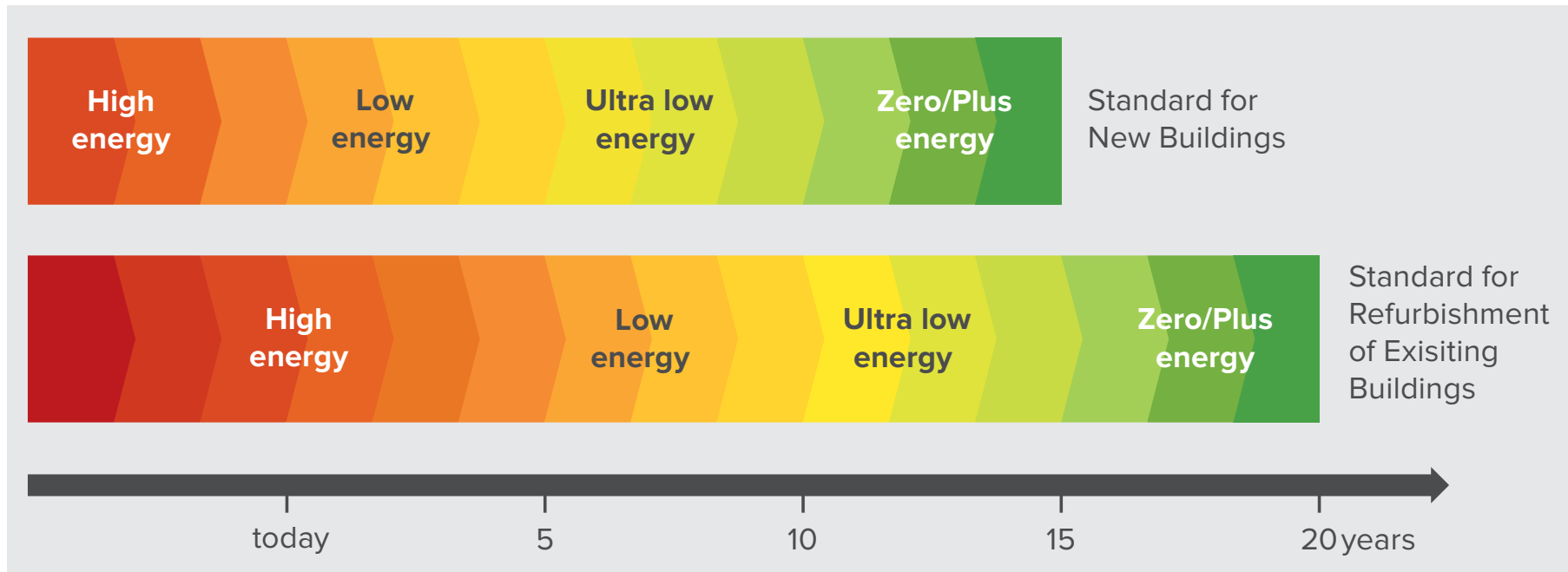


# Cost and Cost-effectiveness





# Timeline for Standards





# The Strategic Approach

First worldwide consistent approach to defining Low-Energy and Ultra-Low-Energy Buildings in different climate zones

- Easy to Define
- Absolute Target Values
- Covering 4 Climate Zones (more to come)
- 4 different types of conditioning
- Numerous Types of Buildings

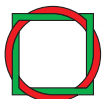


Your guide to energy efficiency in buildings.

Start now



[bigee.net](http://bigee.net)



**Wuppertal Institute**  
for Climate, Environment  
and Energy