

RESULTS

Energy consumption in building sector (EU)

Space heating
62.8%

Eurostat 2020

DATA

CMIP6 simulations

4 SSP scenarios
(SSP5-8.5, SSP3-7.0, SSP2-4.5 et SSP1.26)

10 models Selected **3 variables**
(T°, Tmax°, Tmin°)

Downscaling and bias correction

METHOD

Winter (ONDJFM)

HDD $\sim \text{Diff}(T^\circ, T_{\text{threshold},H})$

$T_{\text{threshold},H} = 15.5$

2

CDD $\sim \text{Diff}(T^\circ, T_{\text{threshold},c})$

$T_{\text{threshold},c} = 22$

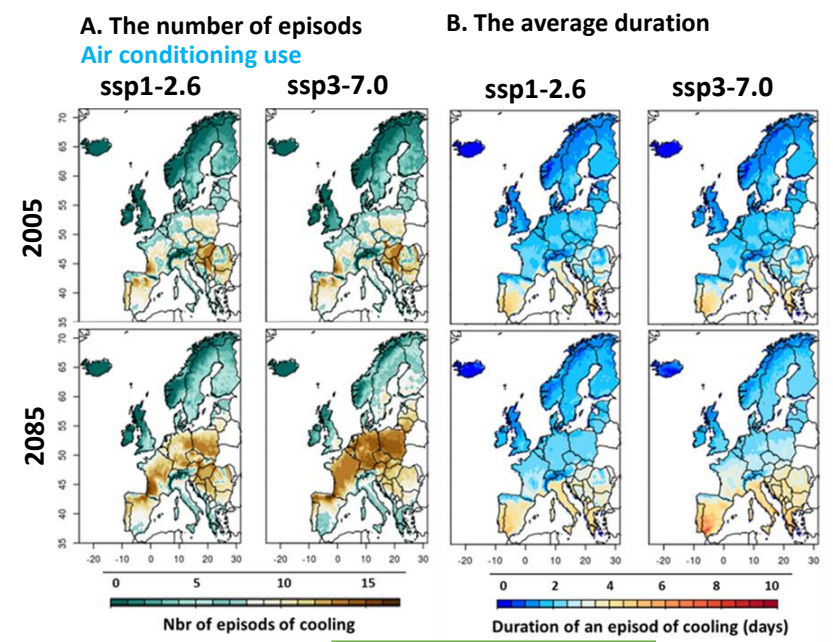
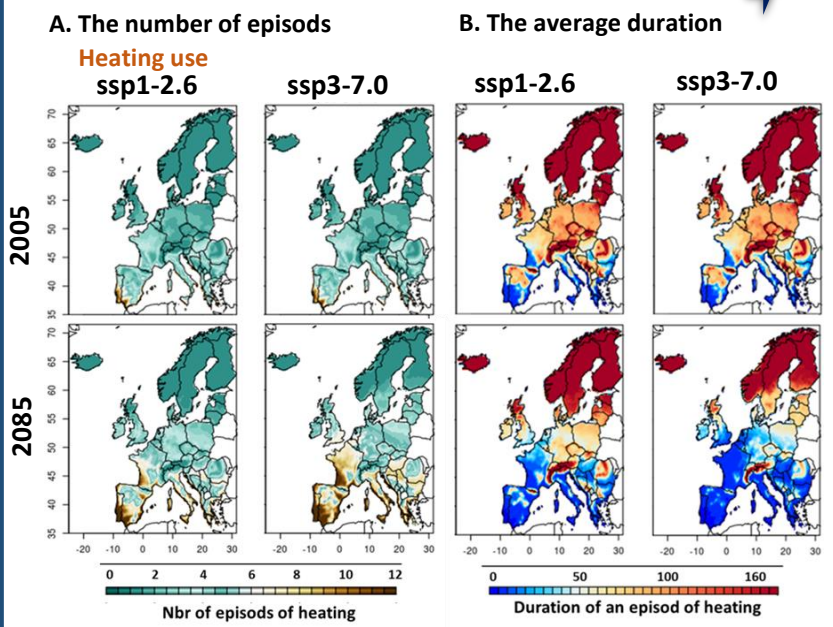
Summer (AMJJAS)

2 periods

Use of air conditioning **Use of heating**

More than 2 successive days with CDD > 1°

More than 2 successive days with HDD > 1°



- Fragmentation of heating periods**
In the future, the periods of heating use will become more fragmented in winter under the 4 climate scenarios.
- Increase of duration of heating break periods**
The periods of heating non use will become also longer in several regions of Europe.
- Increase of duration and frequency of air conditioning use periods**
Conversely, the periods of air conditioning use in the future will become more frequent and longer.

Energy system challenges

- Electric system flexibility**
massive deployment of renewable energies + fragmented and variable demand --> A need for flexibility for the balance of the supply-demand
- Significant economic cost linked to flexibility needs**
A more fragmented and more variable demand could generate significant costs on the electricity system linked to the needs for flexibility

