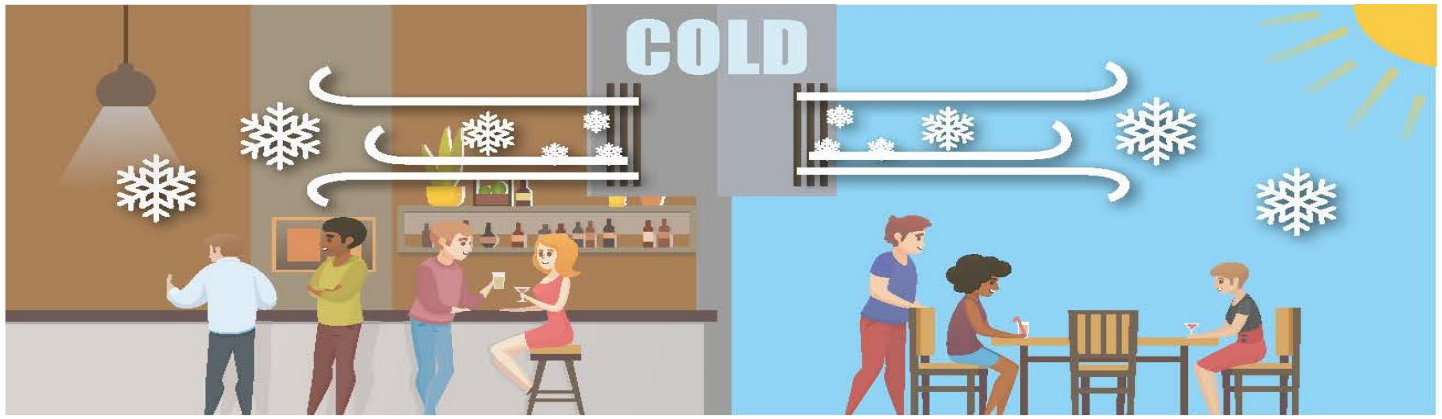
Cooling Energy Demand

SOCLIMPACT

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 776661.

Climate change may impose welfare reductions to the European islands' societies by affecting thermal comfort. Cooling Degree Days (**CDD**) are a measure of how much (in degrees), and for how long (in days), outdoor air temperature is higher than 18°C or 65° Farenheit. The CDD is used as a measure of the energy needed to cool buildings. The increase in CDD and the energy demand (**GWh/year**) for cooling are estimated for the islands, under different scenarios of global climate change.



Low emissions scenario RCP2.6

Ref (1986-2005)	*(2046-2065)*	*(2081-2100)*
210.40 **CDD**	325.64 **CDD**	314.05 **CDD**
1527.41 **GWh/year**	2430.53 **GWh/year**	1705.70 **GWh/year**
		↑ 12%

High emissions scenario RCP8.5

Ref (1986-2005)	*(2046-2065)*	*(2081-2100)*
210.40 **CDD**	454.09 **CDD**	746.00 **CDD**
1527.41 **GWh/year**	3720.94 **GWh/year**	5112.23 **GWh/year**
		↑ 235%

Desalination Energy Demand

SOCLIMPACT

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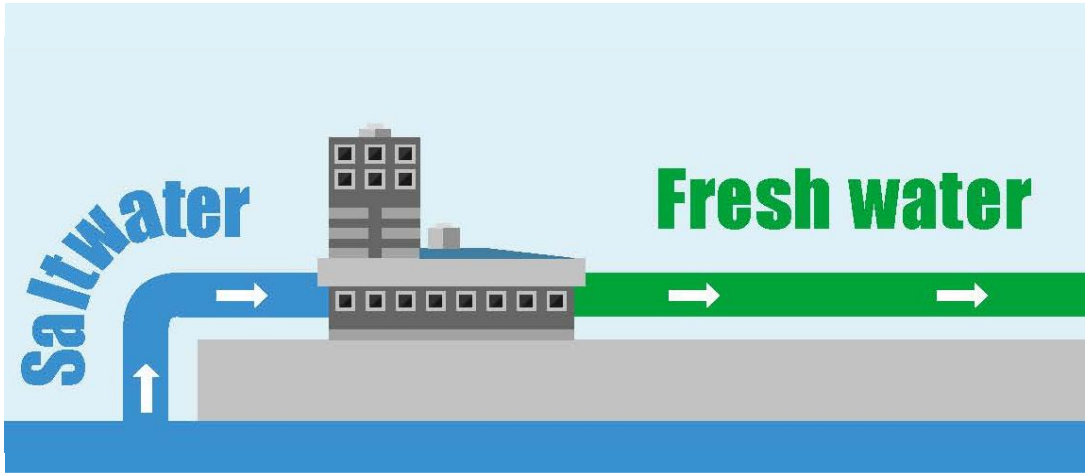
The Standardized Precipitation Evapotranspiration Index (**SPEI**) is analysed as a representative indicator for increases in water demand for islands' residents, tourists and agriculture, while it also provides an indication on the available water stored in dams or underground resources. To estimate the increase of energy demand due to the increase in water demand, it was assumed that most of the islands will have to produce desalinated seawater (or groundwater) to meet further increases of demand. Thus, the estimation of the increase in energy demand (**GWh/year)** to produce more drinking water has been done based on the energy consumption required to desalinate seawater.



Present time: **SPEI 0** **192.78 GWh/year**

	(2046-2065)	*(2081-2100)*
Low emissions scenario RCP2.6	**SPEI -0.6** 239.05 GWh/year	**SPEI -0.6** 239.05 GWh/year ↑ 24%
High emissions scenario RCP8.5	**SPEI -1.4** 300.74 GWh/year	**SPEI -2.3** 458.97 GWh/year ↑ 138%

Legend SPEI : Normal (-1 to 1) Medium Dry (-1 to -1.5) Very Dry (-1.5 to – 2) Extremely Dry (<=-2)

ENERGY *Sicily*