SUPPLEMENTARY MATERIAL

The Supplementary Material is divided in two items (SMI and SMII).

SMI - Materials and Methods

Part of data used in Materias and Methods are presented in Figure S1 and Tables S1-S3.

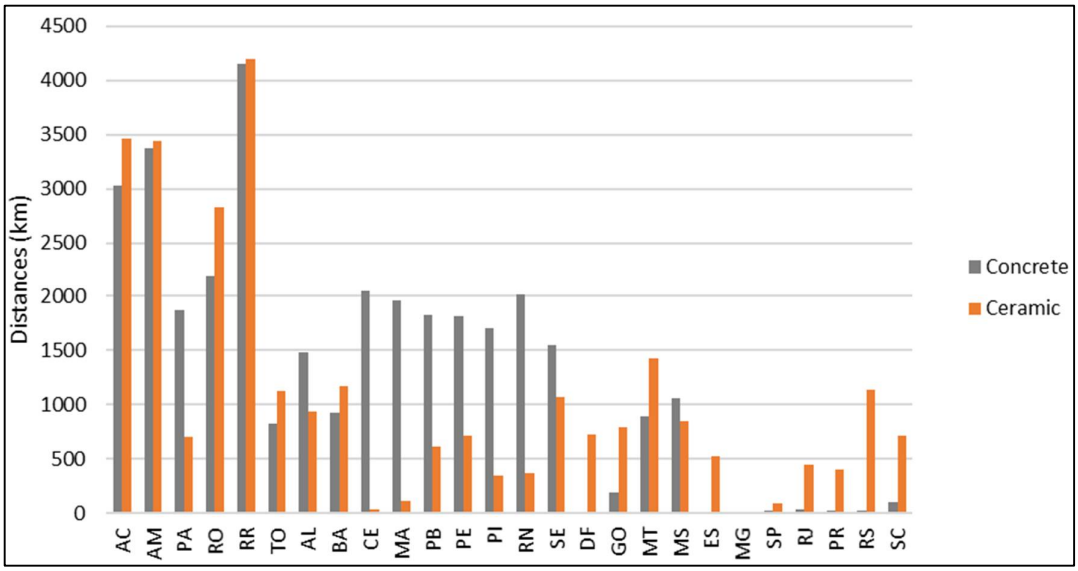

Figure S1. Transportation distances of concrete and ceramic blocks.

Table S1. Datasets used in the Life cycle GHG emissions inventory.

Materials production	
Concrete block (kg)	Souza et al. [27]
Ceramic block - Wood chips (kg)	Souza et al. [27]
Ceramic block - Natural gas (kg)	Clay brick {RoW}. Electricity change for the BR mix. Ecoinvent v. 3.3
Transportation	
Transport 100% Default (t.km)	Carried 100%: 1 tkm Transport, truck 10-20t, EURO3, 100%LF, default/GLO Mass; Ecoinvent v. 3.3
Transport 100% Empty return (t.km)	Empty return 100%: 1 tkm Transport, truck 10-20t, EURO3, 100%LF, empty return/GLO Mas. Ecoinvent v. 3.3
Transport 80% Default (t.km)	Carried 80%: 1 tkm Transport, truck 10-20t, EURO3, 80%LF, default/GLO. Ecoinvent v. 3.3
Transport 80% Empty return (t.km)	Empty return 80%: 1 tkm Transport, truck 10-20t, EURO3, 80%LF, empty return/GLO.Ecoinvent v. 3.3

Transport 50% Default (t.km)	Carried 50%: 1 tkm Transport, truck 10-20t, EURO3, 80%LF, default/GLO. Ecoinvent v. 3.3
Transport 50% Empty return (t.km)	Empty return 50%: 1 tkm Transport, truck 10-20t, EURO3, 80%LF, empty return/GLO. Ecoinvent v. 3.3

Table S2. Input data for Housing Deficit calculation.

% of Houses type						
Years	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045
B1 - Building type 1	38%	35%	30%	25%	22%	20%
B2 - Building type 2	40%	42%	41%	41%	41%	42%
B3 - Building type 3	22%	23%	29%	34%	37%	38%
Wall area of Houses type						
B1 (m²/house)	98,9	98,9	98,9	98,9	98,9	98,9
B2 (m²/house)	154,9	154,9	154,9	154,9	154,9	154,9
B3 (m²/house)	266,1	266,1	266,1	266,1	266,1	266,1
Equivalent wall area (m²/house)	158,084	160,876	170,348	178,708	183,724	185,956

SMII - Results

Part of the results are presented in Figures S2-S37.

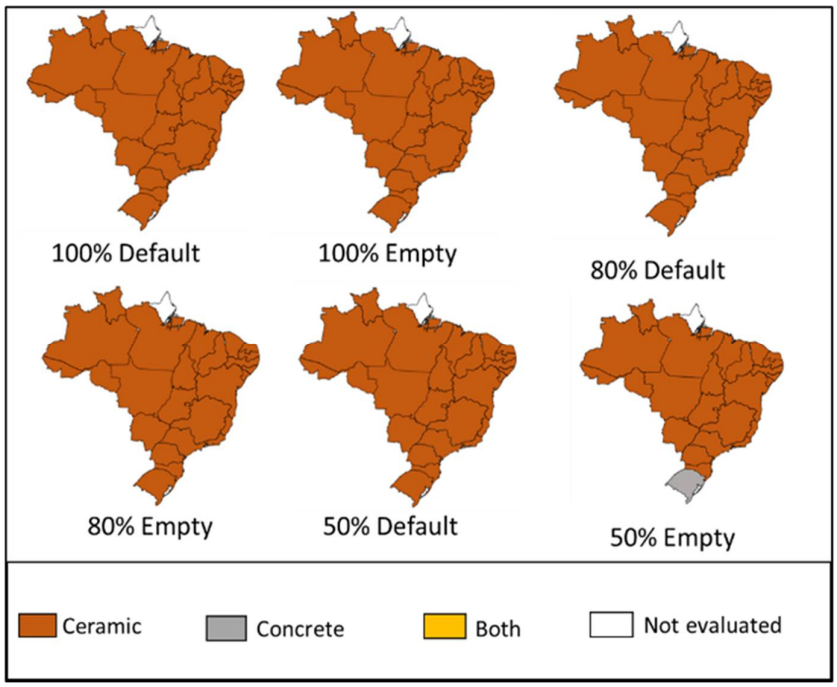

Figure S2. Climate Change Impact – comparison between concrete and ceramic blocks. Orange = Ceramic blocks are the most advantageous; Gray = Concrete blocks are the most advantageous; Yellow = Less than 5% difference between ceramic and concrete blocks.

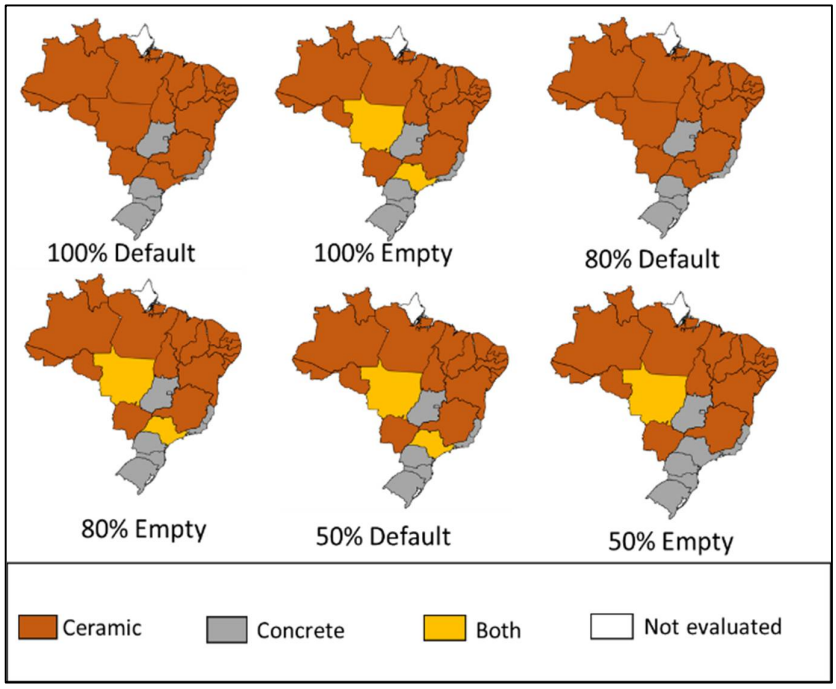

Figure S3. Human Health Impact – comparison between concrete and ceramic blocks. Orange = Ceramic blocks are the most advantageous; Gray = Concrete blocks are the most advantageous; Yellow = Less than 5% difference between ceramic and concrete blocks.

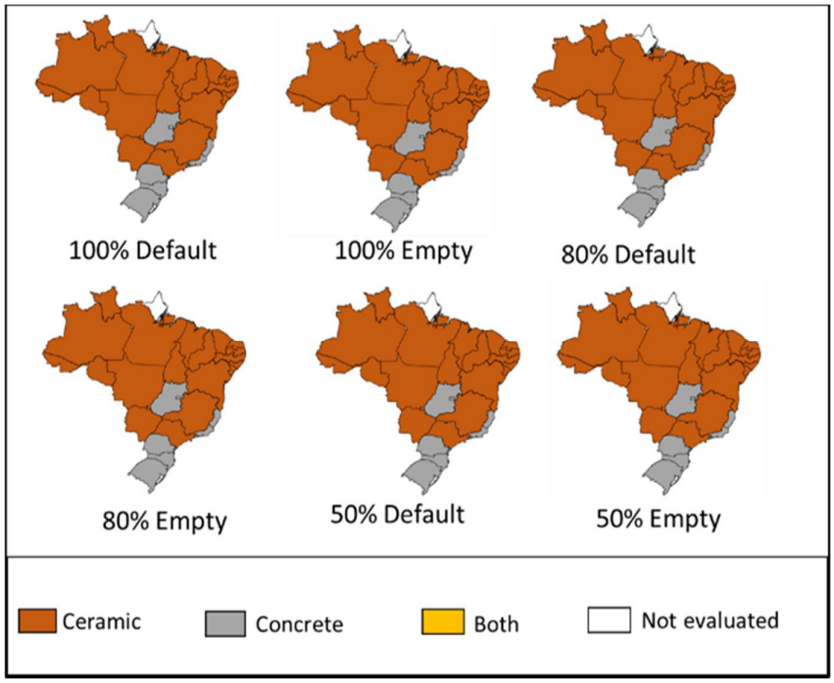

Figure S4. Ecossystem Quality Impact – comparison between concrete and ceramic blocks. Orange = Ceramic blocks are the most advantageous; Gray = Concrete blocks are the most advantageous; Yellow = Less than 5% difference between ceramic and concrete blocks.

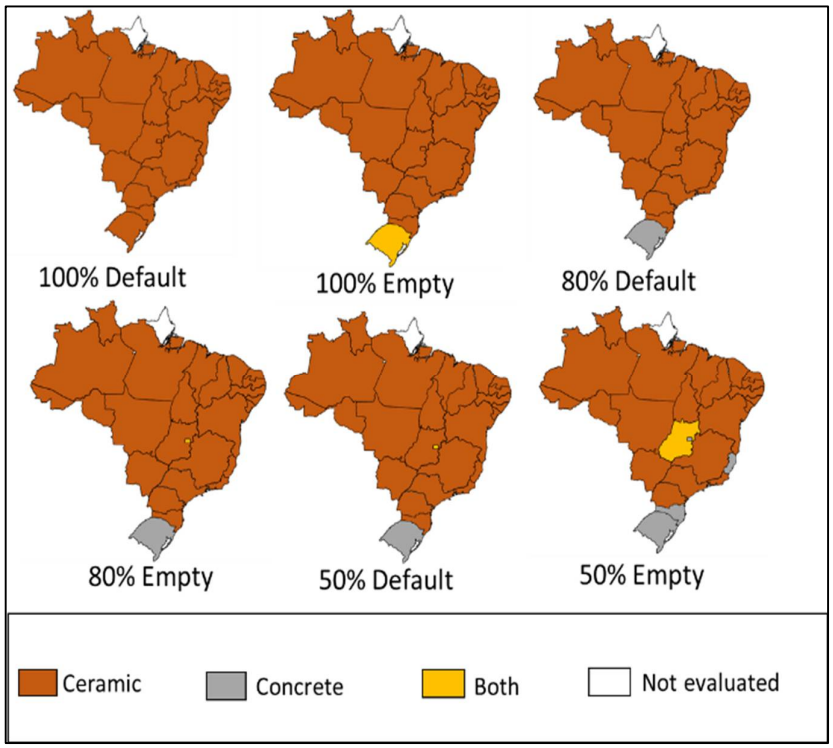

Figure S5. Resources Depletion Impact – comparison between concrete and ceramic blocks. Orange = Ceramic blocks are the most advantageous; Gray = Concrete blocks are the most advantageous; Yellow = Less than 5% difference between ceramic and concrete blocks

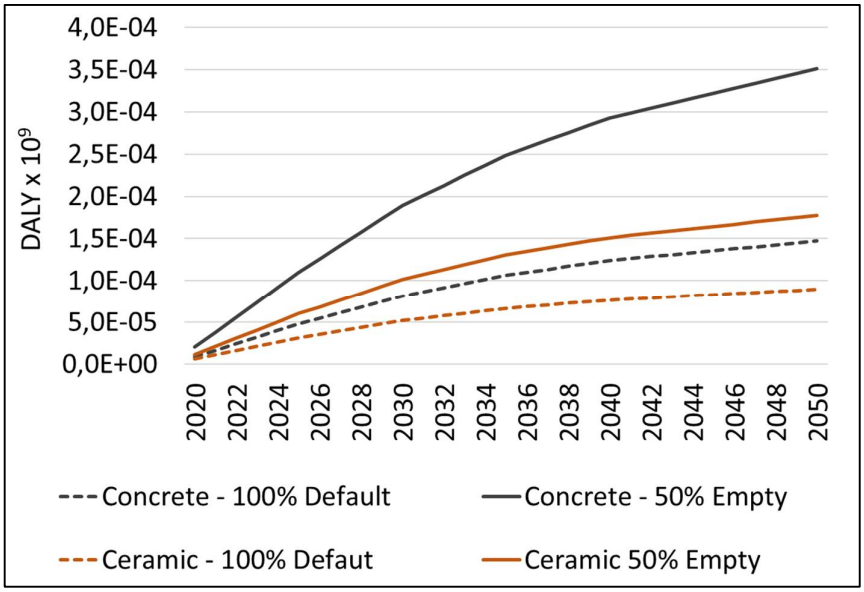

Figure S6. Human health impact considering the housing deficit projection.

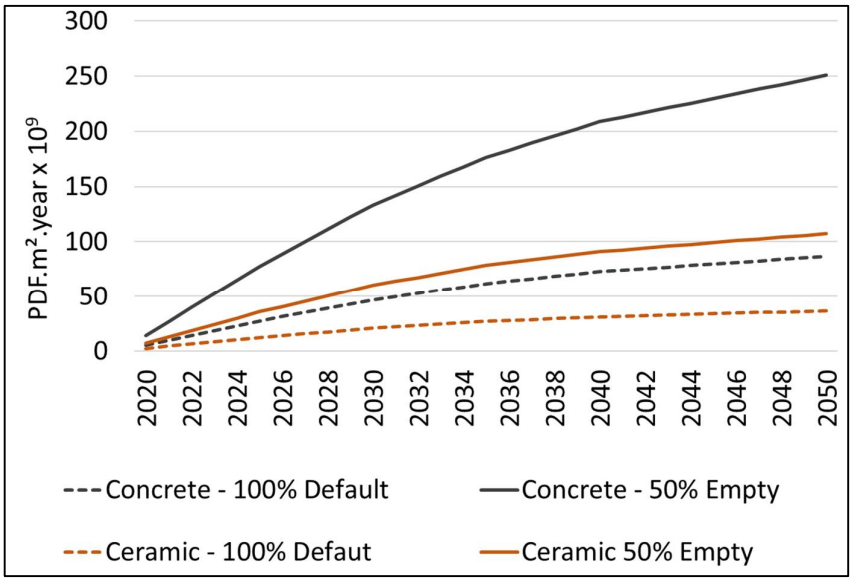

Figure S7. Ecossytem quality impact considering the housing deficit projection.

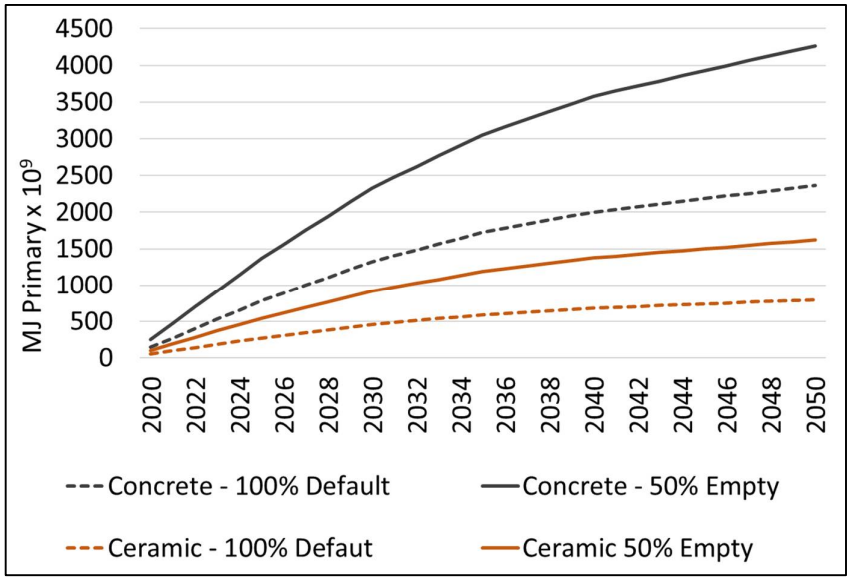

Figure S8. Resources depletion impact considering the housing deficit projection.

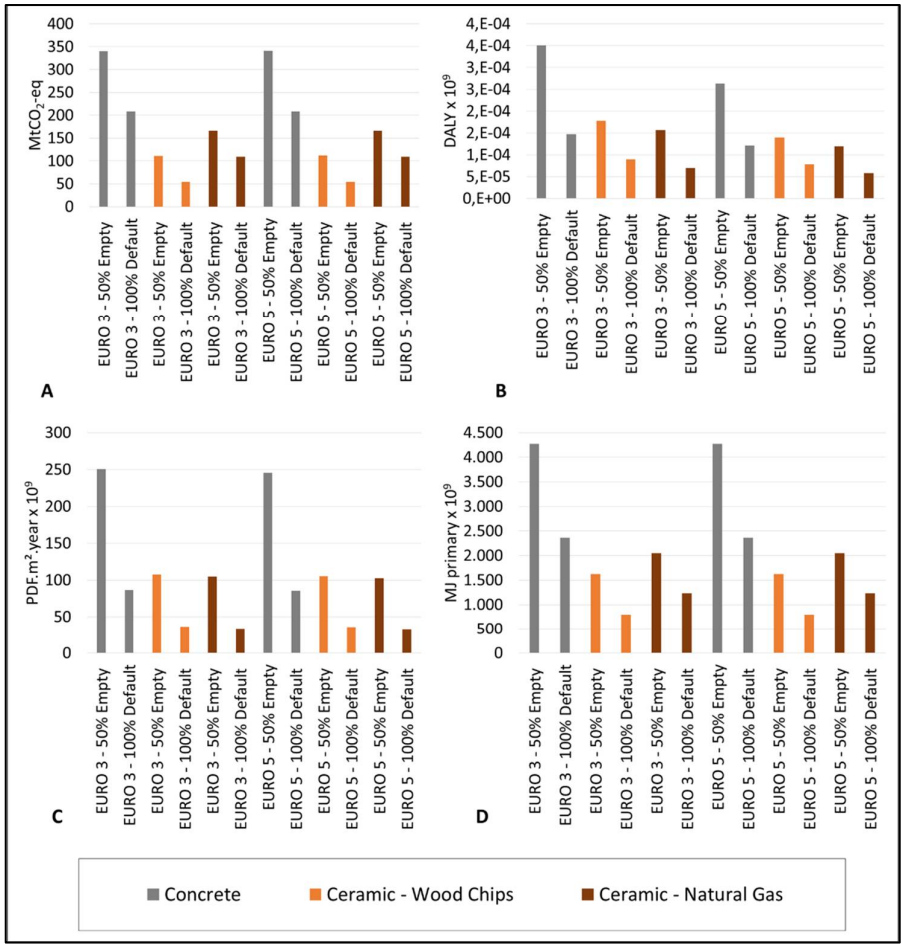

Figure S9. Detailed results of all **i**mpact categories considering the housing deficit for different sensitivity analysis scenarios. Results are normalized by Concrete blocks – EURO 3 – 50% Empty scenario. (A) Climate Change (B) Human Health (C) Ecosystem Quality (D) Resources Depletion.