



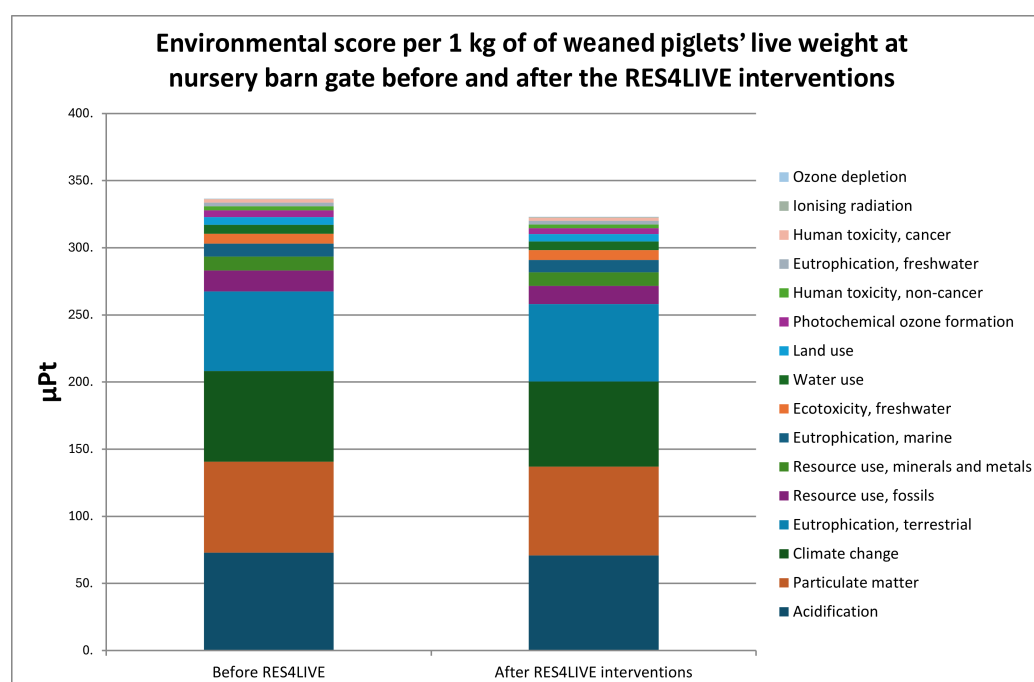
## Environmental and Economic Assessment of Integrated Renewable Energy Systems in a Commercial Swine Farm

Adopting renewable energy systems (RES) can play a key role in improving the sustainability of farming practices. A study on a commercial swine farm in Italy evaluated the environmental and economic impacts of such a system in comparison to the system before installing RES, highlighting how swine farmers could benefit from available funding to support its implementation.

The system used includes:

- A 7.68 kW<sub>el</sub> - 25 kW<sub>th</sub> photovoltaic-thermal (PVT) system
- A multisource heat pump (35 kW)
- A 30m borehole thermal energy storage system
- A smart control system

When compared to the LPG boiler used before the project for heating the nursery barn of this farm, the RES4LIVE system could reduce the overall environmental burdens by 4%. This includes reducing the overall environmental burden caused by photochemical ozone formation (15%), non-renewable fossil resource consumption (15%), cancer-related human toxicity (13%), and climate change impact category (6%).



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Economically, with EU subsidies covering either 20% or 40% of the total investment costs to support decarbonization, the discounted payback period for this system could range from 21-22 years in the former case, to 13-14 years in the latter.

Implementing similar systems on swine farms in Italy could improve both environmental and financial sustainability.

