

«Smart computing system to monitor and abate the indoor concentrations of NH₃, CH₄ and PM in pig farms» LIFE-MEGA

PROJECT LOCATION: Italy and Spain

BUDGET INFO:

Total amount: 1,729,272 €

% EC Co-funding: 53.14%



DURATION: Start: 01/10/19 - End: 30/09/22

PROJECT'S IMPLEMENTORS:

Coordinating Beneficiary: Università degli Studi di Milano (UMIL)

Associated Beneficiaries:

- Institute for Food and Agriculture Research and Technology (IRTA)
- NUVAP s.r.l.
- Rota Guido s.r.l.

OBJECTIVES & SCOPE

The LIFE-MEGA project intends to implement in pig houses a microclimatic device able to continuously monitor and control the concentration of NH_3 , CH_4 , PM and VOCs.

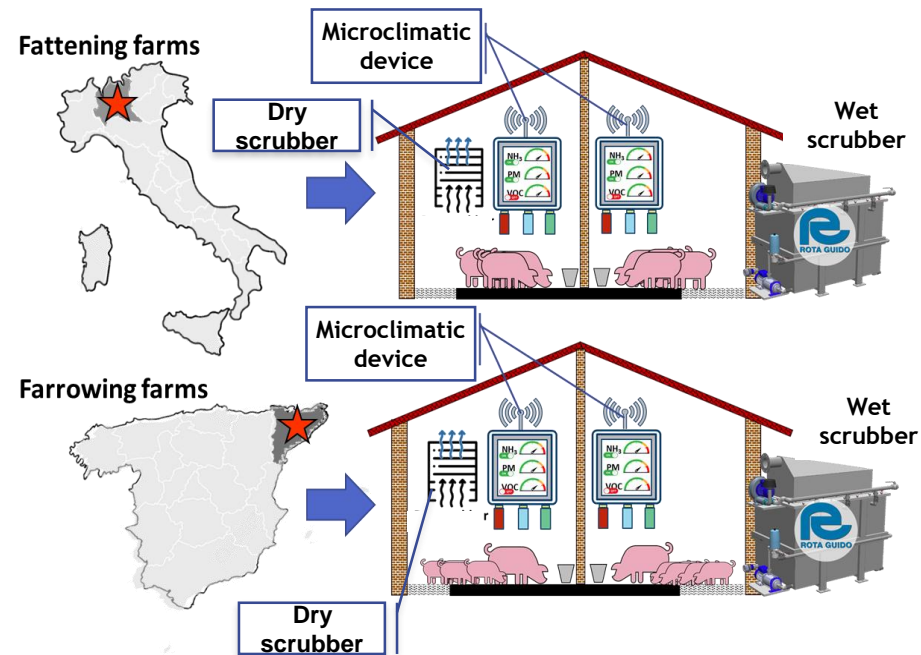
The device will activate the abating systems for emissions control.

For the abatement of gases and PM inside the pig barns, two different technologies will be tested:

- i) a prototype of a wet scrubber;
- ii) a dry scrubber.

Key actions:

- Setup of abating technologies and evaluation protocols;
- Monitoring and control of NH_3 , CH_4 and PM emissions in pig barns;
- Optimization of the scrubber systems through the microclimatic tool implemented with AI;
- Animal Performance and Welfare Indicators;
- LCA to estimate the environmental benefits;
- Socio-economic study.



EXPECTED IMPACTS

The evaluation of the LIFE MEGA Environmental KPIs will be developed aimed at consolidating the data and results over the project lifetimes according to the data gathered in every progress report, and their expected evolution in the following 5 years.

LIFE-MEGA KPIs

Total NH₃ emission reduction: - 48% (-15% dry scrubber; -80% wet scrubber)

Total PM₁₀ emission reduction: - 70% (-40% dry scrubber; -100% wet scrubber)

Total PM_{2.5} emission reduction: - 58% (-15% dry scrubber; -100% wet scrubber)

	Fattening pigs - Italy		Farrowing pigs - Spain	
	Wet scrubber	Dry scrubber	Wet scrubber	Dry scrubber
NH ₃	- 1.90 kg NH ₃ head ⁻¹ year ⁻¹	- 0.35 kg NH ₃ head ⁻¹ year ⁻¹	- 3.88 kg NH ₃ head ⁻¹ year ⁻¹	- 0.73 kg NH ₃ head ⁻¹ year ⁻¹
PM _{2.5}	- 73 g PM _{2.5} head ⁻¹ year ⁻¹	- 22 g PM _{2.5} head ⁻¹ year ⁻¹	- 136 g PM _{2.5} head ⁻¹ year ⁻¹	- 41 g PM _{2.5} head ⁻¹ year ⁻¹
PM ₁₀	- 444 g PM ₁₀ head ⁻¹ year ⁻¹	- 178 g PM ₁₀ head ⁻¹ year ⁻¹	- 842 g PM ₁₀ head ⁻¹ year ⁻¹	- 337 g PM ₁₀ head ⁻¹ year ⁻¹

POLICY IMPLICATIONS

- European IPPC Bureau → BREF document for BAT
- Welfare Quality® protocol
- The Guidance document for the exchange of information under IED (Commission Implementing Decision 2012/119/EU) will be reviewed
- Several organizations, institutions and Focus Group currently involved in policy making, directives upgrading and reference documents development will be contacted
 - European IPPC Bureau in IPTS
 - TWG on Strategies and Review of the UNECE Convention on LTRP.
 - National entities involved in the development of Codes of Good Agricultural Practice (COGAP) required by the Gothenburg Protocol to reduce NH₃ emissions
 - Agricultural Ministry of the Catalan Government
 - Climate Change Catalan Office
 - Catalan Farmers' Federation (FCAC)
- Deliverables will be shared with JRC to implement the online Emission Database for Global Atmospheric Research (EDGAR)
- European Sustainable Phosphorus Platform
- EIP Agri Network

CONTINUATION

Replicate the proposed solutions in other European farms to corroborate the effectiveness of the technologies and promote their spreading in European countries

- Rota Guido and Nuvap will have a fundamental role in the dissemination of the demonstration results
- After scrubber systems demonstration, the replication of the know-how and experience acquired in the demonstrative fields will be shown to other farms
- Rota Guido will prepare a business plan and market strategy for the final product integrated with the Nuvap AI
- The replications will be accompanied with training sessions and study visits
- Results will be transmitted to the national and EU legislators