

# The tragedy of the cows: exploring the short and long-term warming effect of methane emissions in agricultural mitigation

## Highlights

- *Recently, there is renewed attention for the implications for climate policy of the short lifetime of methane (initial strong warming, largely disappearing after about 20 years). Several attempts have been made to capture this in alternative warming accounting metrics, such as GWP\*.*
- *Our analysis shows that focusing either on the short-term or long-term warming effect of methane can alter the perception of how much effort the agricultural sector should contribute to climate change mitigation. Valuing short-term (long-term) warming effects in the accounting of methane emissions will lead to higher (lower) expectation for agriculture to contribute to mitigation efforts.*
- *While agriculture is projected to continue to drive global warming without additional mitigation efforts throughout the next decades, the magnitude varies across regions.*
- *Under ambitious non-CO2 mitigation efforts, the reduction of agricultural methane emissions and their short liveness could contribute to a reduction of global warming, while N2O emissions will still continue causing additional warming.*
- *The combination of stringent mitigation and dietary changes could help additional global warming turn negative, especially when considering the long-term warming dynamics of methane.*
- *The tragedy of the cows lies in the increase of the significance of low animal protein diets relative to mitigation technologies. On the one hand, carbon pricing based on the long-term warming impact of methane relieves pressure to reduce cattle herds. On the other hand, that pricing regime also highlights the large immediate benefits of reducing methane in the short-term as part of a transition towards a less animal-based diet.*