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## SUSTAINABLE BIOMETHANE: METHANE SLIP REMOVAL APPLYING REGENERATIVE CATALYTIC OXIDATION (RCO) POST COMBUSTION TECHNOLOGY

*Short communication*

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### Abstract

Biomethane is incentivized in Italy and in many other European countries as a substitute fuel for transport, in order to reduce fossil fuel and cut CO<sub>2</sub> emissions. In Italy, Certificato di Immissione in Consumo (CIC) is actually sustaining biomethane production, charging petrochemical companies who need to cover their obligation quotes. Actually, biomethane production has to fulfil sustainability requirements in order to be entitled to get CIC. Sustainability principles are, among others, the type of feeding, total biogas capture during the fermentation process and last but not least, a very low methane loss associated to the off-gas of the upgrading unit, actually set at < 1 % CH<sub>4</sub> in Italy and most probably further reduced in the short. The upgrading unit off-gas, therefore, has to respect the limit, or as an alternative, it has to be treated in a post-combustion unit. There are technical upgrading solutions on the market that can achieve methane loss < 1% CH<sub>4</sub>, but incremental energy, operating and investment cost have to be considered in a cost-benefit evaluation. Post-combustion on the other hand can be a serious issue, since the flow to be burnt does not contain oxygen at all, just traces of methane (normally 2-3%) and CO<sub>2</sub> (97-98%), changing dramatically operating conditions of traditional post-combustor units applied to cogeneration engines off-gas. For the biomethane off-gas combustion, a sustainable cost-effective solution is the Regenerative Catalytic Oxidation (RCO), operating at lower temperature than Thermal Oxidation (TO), therefore reducing energy costs and improving environmental footprint. The purpose of this article is to compare the Regenerative Thermal Oxidizer (RTO) with the Regenerative Catalytic Oxidizer (RCO).

*Key words:* biomethane, methane-slip, off-gas, sustainable biomethane

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