

How refineries can be decarbonised today

Amsterdam-based Angara recently received TRL8+ rating in DNV Report for its DecarbonX programme, a new AI-based technology it proposes as a 'clean' alternative to the mechanical cleaning of fouled refineries and process equipment in the oil and gas industry. TRL or Technology Readiness Levels are a method used to measure and assess the maturity of a particular technology. Petra Koselka, Angara COO, points out that while the industry focuses on large-scale projects to deliver on energy transition, the imperative remains to significantly decarbonise existing assets now. "Making assets more energy efficient and carbon cost resilient has become even more critical."



Fouling has been a chronic problem for the oil and gas industry for centuries. Since the negative effects of fouling were recognized, the only broadly accepted approach is mechanical cleaning. As this can only be done off-line, it impacts plant uptime and carries physical (HSSE) risks and can only be done with significant time intervals. Worse still, the equipment performance declines rapidly resulting in a significant loss of efficiency and a direct increase in CO₂ output. "Mechanical cleaning requires a lot of water, and a lot of time. It's also dirty, potentially dangerous work," Ms. Koselka adds. Addressing these issues, Angara's DecarbonX technology does not require the plant to shut down, is much cleaner, and doesn't put workers at risk. It utilises proprietary AI-based technology to determine the proper actions and

schedules to keep Heat exchangers performing optimally, not only every 3-5 years but all the time. This, coupled with Angara's exclusive smart recipes and innovative decarbonisation technology targets to reduce more than 400MM tons of CO₂ emissions and realizing \$50Bn in savings per year within petroleum refining, petrochemical, chemical, and other energy intensive industries globally.

Angara's technology is currently being deployed at scale with clients in Europe, Southeast Asia and the United States. "We don't do the actual cleaning work ourselves," says Ms. Koselka. "As a technology company, we work with contractors who already do the cleaning work for the refinery, and know the plant inside and out. We don't want to take jobs from these contractors. Using

conventional methods, the contractors clean every four years or so, but with our technology they clean more often, so it's actually more work for them. We provide the technology, the chemicals, and the supervision."

Angara has a focus on European Refineries now because that's where both the greatest need and the greatest opportunities are, particularly as a result of the huge CO₂ tariffs currently imposed within the EU. "But we will roll it out worldwide, and also into other verticals. Fouling is an issue in different areas within the oil and gas industry itself, but also in the production of biofuels, and in the geothermal industry, among others." Angara's main challenge, in her view, is that they're selling into what is a rather conservative industry. "Oil and gas companies all have big plans underway in support of the energy transition. But many of these projects are a couple of years out and require significant investment. Our message to them is that while it's important to invest in the future, with our technology, they can decarbonise their existing assets today."

DECARBONX

The scalable decarbonization solution reducing emissions by up to 25%.



- Smart Formula / AI solution
- CO₂ emission reduction
- Increased energy efficiency
- Improved production yield
- DNV Report validation at TRL8-9

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