Honeywell Selected for Phelan Green eSAF Jet Fuel Plant Carbon Capture; CO2 Source Unstated

Phelan Green says invasive-plant biomass will supply CO2; Honeywell release omits source and contract value

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(PHOTO: HONEYWELL.COM)

Honeywell said Nov. 18 that its **Advanced Solvent Carbon Capture technology** (ASCC) and modular engineering will be used in the first phase of Phelan Green's eSAF plant near Hopefield, South Africa, a project designed to make 35,000 metric tons (38,581 short tons) of synthetic jet fuel a year from green hydrogen and captured carbon dioxide (CO2). The release does not say where that CO2 will come from, yet the source decides whether the fuel counts as low-carbon in Europe, and Phelan Green has said elsewhere that it plans to use **biogenic CO2 from invasive plants** burned in a biomass boiler.

Release Pairs ASCC With Modular Engineering but Omits Contract Value and CO2 Source

Honeywell's release, issued from Charlotte, N.C., lists ASCC and modular engineering for Phase 1 alongside UOP FT Unicracking, HyCOgen and FT-CANS, a Fischer-Tropsch technology Honeywell says it developed jointly with bp. It gives no contract value, module count, fabrication location or dates. Blair Phelan, Phelan Green's managing director, said the modular delivery model is "designed to simplify execution." Honeywell's Rajesh Gattupalli said cost remains a key obstacle to scaling SAF production, and the company says its process technology supports roughly 30% of global SAF production, according to the **Hydrocarbon Processing report** on the announcement.

The plant would be built in two steps. Phase 1 targets 35,000 metric tons (38,581 short tons) of eSAF a year from 20,000 metric tons (22,046 short tons) of green hydrogen, made by a 200 MW electrolyzer from China's Sungrow that forms the **first tranche of 800 MW**. The full build would reach 80,000 metric tons (88,185 short tons) of hydrogen and up to 140,000 metric tons (154,323 short tons) of eSAF a year. Engineering News reported that Phase 1 carries a budget of R12 billion (approximately $709 million USD), part of a R47 billion program (approximately $2.78 billion USD; Honeywell cites $2.5 billion).

Honeywell's role has grown in steps. Honeywell announced April 1 that Phelan Green had **selected its UOP FT Unicracking** technology to upgrade synthetic crude into jet fuel. On June 16, Johnson Matthey and Phelan Green announced **license and engineering agreements** for HyCOgen, which converts CO2 and hydrogen into carbon monoxide, and FT CANS; Blair Phelan said they complete the technology backbone. Honeywell then **completed its £1.325 billion acquisition** (approximately $1.75 billion USD) of Johnson Matthey's Catalyst Technologies business on July 17, so both technologies now sit in Honeywell's portfolio.

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Where Does CO2 for Phelan Green's Jet Fuel Come From?

Honeywell's release is silent on the carbon source, a gap that matters because eSAF is only as low-carbon as the CO2 it is made from. **AirInsight estimated in July** that Phase 1 needs about 110,000 metric tons (121,254 short tons) of CO2 a year and asked where it would come from.

Phelan Green has since answered in part. Blair Phelan told ChemAnalyst in July that invasive alien plants are the primary feedstock, burned in a biomass boiler, with CO2 from that process captured and unnamed additional carbon sources to supplement it. A **regulatory notice prepared by WSP** describes eSAF made from biogenic CO2 captured with carbon capture technology. Engineering News reported Sept. 18 that biogenic CO2 would come from a colocated 8 MW biomass plant, with environmental authorization expected in the fourth quarter of 2026.

Neither source names ASCC as the system for the biomass boiler, and Honeywell has not specified the feed gas. The link between **Honeywell's flue-gas technology** and Phelan Green's boiler is therefore an inference, not a confirmed design.

Origin also decides eligibility. Under EU rules for renewable fuels of non-biological origin, **compliance summaries say** biogenic CO2 qualifies only from biomass that meets sustainability criteria, while fossil industrial CO2 is accepted only for a limited period. Hydrocarbon Processing lists reliable biogenic CO2 supply as an **execution risk for the project**.

Read more: Infinium's Waste-CO2 Jet Fuel Enters US Commercial Airport Tanks for First Time

ASCC is a post-combustion amine system. Honeywell says it captures **over 95% of CO2** from flue gas, using a proprietary solvent that needs less regeneration energy and compression than other amine systems. Honeywell licensed the technology from the University of Texas at Austin's Texas Carbon Management Program, led by Gary Rochelle, according to **UT Austin's announcement**.

Engineering News describes the chain that follows: electrolysis makes hydrogen; HyCOgen reacts CO2 with hydrogen to form carbon monoxide; that carbon monoxide is combined with more hydrogen into syngas; FT CANS converts the syngas into synthetic crude; and UOP Unicracking upgrades it into jet fuel. The carbon monoxide step is a reverse water-gas shift, needed because **Fischer-Tropsch catalysts do not typically** take CO2 directly.

The main engineering constraint is heat. **Amine scrubbing is mature**, in industrial use since the 1930s, but in conventional monoethanolamine and diethanolamine systems regenerating the solvent can account for up to 70% of operating costs. Scotland's environmental regulator SEPA has flagged that **nitrosamine and other degradation-product emissions** from amine systems remain uncertain. Honeywell has not disclosed the solvent chemistry or where the regeneration heat will come from.

The CO2 demand is large. The French Institute of International Relations (IFRI) put the **stoichiometric requirement at 3.1 to 3.3** metric tons of CO2 per metric ton of e-SAF, and about 5 metric tons under industrial conditions. Applied to Phase 1's 35,000 metric tons (38,581 short tons), that ratio implies roughly 108,500 to 115,500 metric tons (119,600 to 127,300 short tons) of CO2 a year, or about 175,000 metric tons (192,900 short tons) at industrial conditions.

Schedule and Financing Reports Differ on Financial Close, First Fuel and FID Announcement

Phelan Green reached a final investment decision in mid-September, according to **Hydrocarbon Processing's FID report**, which said the full financing structure is undisclosed and noted the IEA's finding that only one of Africa's 31 low-emissions hydrogen projects targeting 2030 production has reached FID. Accounts differ on who announced it: **SAnews reported the announcement** through Minister Kgosientsho Ramokgopa on behalf of President Cyril Ramaphosa, while Mining Weekly reported the president was unwell.

Timing also varies. Honeywell's April 1 release pointed to construction starting in the fourth quarter of 2026. Search summaries of September Engineering News reports point to later construction and first fuel or exports in 2029, though TechTimes could not retrieve those pages in full and the quarter-level dates are unconfirmed. The same reports quote Blair Phelan saying the family board would underwrite R2 billion (approximately $118 million USD) of the R12 billion, about one-sixth.

The regulatory notice places the site about 5 kilometers (1.9 miles) north of Hopefield, while Oxpeckers environmental reporting put it about 1 kilometer (0.6 miles) from the town. Construction requires an environmental authorization, an Atmospheric Emission Licence and a water-use authorization.

Botanist Nick Helme told reporters the site holds about 25 threatened plant species and rated the impact "high negative," while hydrogeologist Dale Barrow said aquifer effects are difficult to predict. Anthea Abraham of Phelan's communications team said the site was chosen after assessments and that the plant would use zero liquid discharge. Phase 1 would need 2 million liters of water a day (528,000 gallons), rising to 8 million liters (2.1 million gallons) at full production. No final authorization had been reported as of late August.

ReFuelEU Synthetic Fuel Targets Create Demand but Carbon Rules Decide Which Fuel Counts

ReFuelEU Aviation requires 6% SAF in 2030, with a synthetic fuel sub-mandate averaging 1.2% across 2030 and 2031, 2% across 2032 to 2034, 5% in 2035 and 35% in 2050. Transport & Environment warned in a Sept. 14 briefing against letting "e-HEFA" count toward the e-SAF mandate.

For Phelan Green, Honeywell's announcement fixes the capture technology class and the modular delivery route, but a reader weighing the project still lacks the contract value, the solvent chemistry, the heat source for regeneration, the confirmed link between ASCC and the biomass boiler, and the environmental authorizations. Each of those determines whether Phase 1 reaches its targeted first fuel in 2029 and whether the fuel counts as low-carbon in the market it is meant to serve.

Currency conversions use the Nov. 16, 2026 exchange rate and are approximate.

Frequently Asked Questions

What is eSAF and how is it made from CO2 and hydrogen?

eSAF is synthetic sustainable aviation fuel made from green hydrogen and captured CO2 rather than from crops or waste oils. The CO2 is converted to carbon monoxide, combined with hydrogen into syngas, turned into synthetic crude by Fischer-Tropsch synthesis and then upgraded into jet fuel.

Where will Phelan Green's CO2 come from?

Phelan Green's managing director told ChemAnalyst the primary feedstock is invasive alien plants burned in a biomass boiler, with CO2 captured from that process and other unnamed sources added. Honeywell's release does not name the source or confirm that ASCC will handle that feed.

The solvent must be heated to release captured CO2, and that regeneration step can account for up to 70% of operating costs in conventional amine systems. Honeywell says ASCC uses less regeneration energy than other amine systems but has not published the solvent chemistry or the heat source for this plant.

When will Phelan Green produce its first jet fuel?

Targets differ by source. Honeywell's April release pointed to construction in the fourth quarter of 2026, while search summaries of Engineering News reports point to first fuel or exports in 2029, with quarter-level dates unconfirmed.

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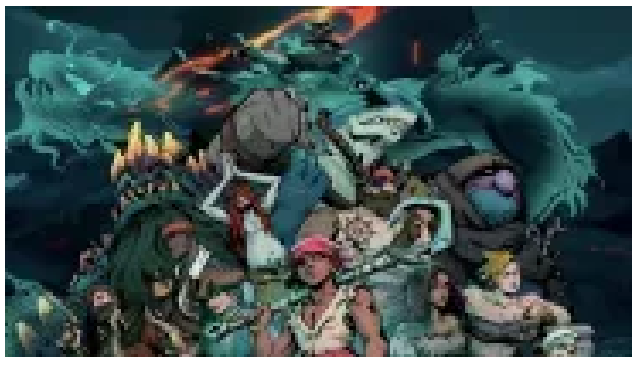
1. 

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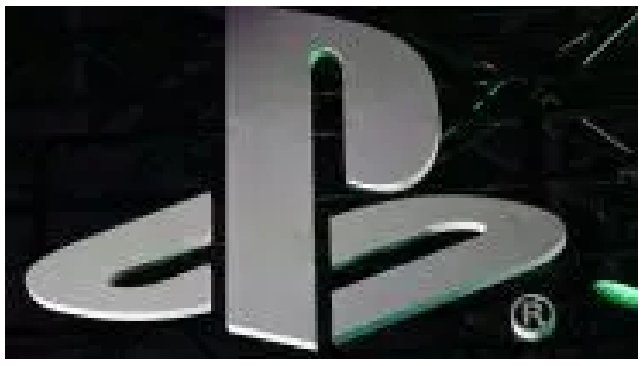
2. 

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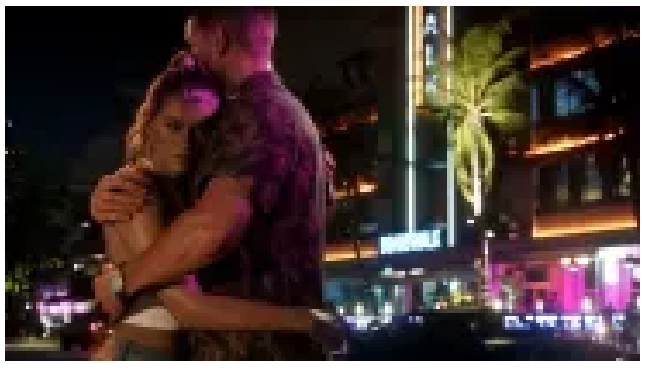
3. 

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