SECOND-SCALE SOLAR NOWCASTING

Solar without a battery. Three years on, the client tripled it.

INSTANT

For off-grid mines, industrial microgrids and any site where the ramp, not the resource, caps solar.

On an unconnected site the limit on solar is not the irradiance, it is the ramp. The standard answer is a battery and the capital it ties up. INSTANT puts second-scale forecasting in that role instead: fisheye imagers on site see cloud that satellite and pyranometers cannot resolve, and the energy management system commits the thermal units before the drop rather than after it. At the Loulo gold mine in Mali, phase one went live in August 2020 with 24 MWp and no storage at all. In 2023 the operator added 48 MW of PV and 24 MWh of battery, a decision taken on the strength of how the forecasting had performed.

01 The Loulo record

24 → 72 MWp

of PV, tripled across two phases, on a 65 MW heavy fuel oil and diesel grid

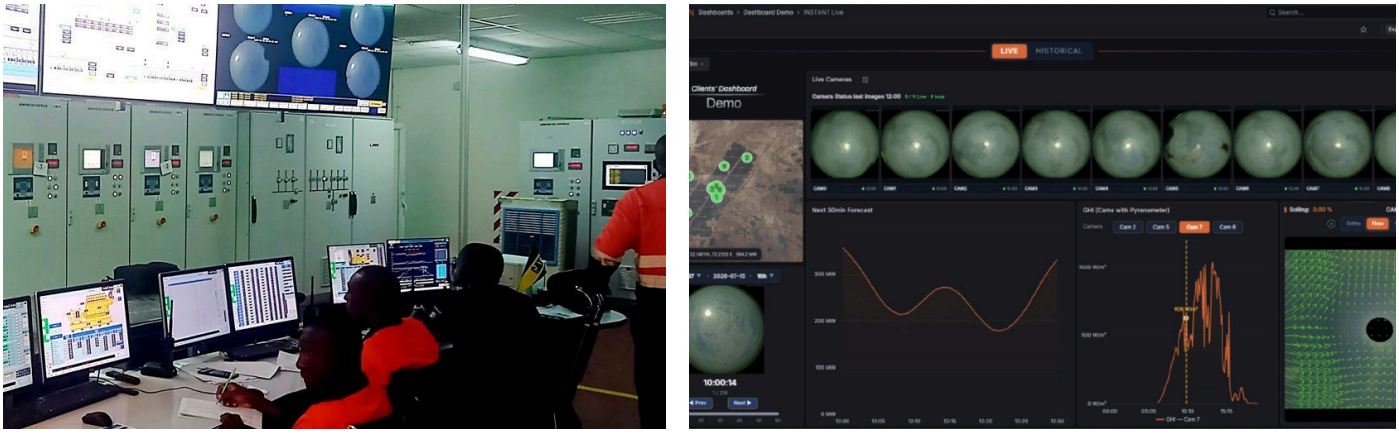
15.6 Ml

of fuel avoided in phase one alone, or 42,050 t CO_2e, per the operator's Q1 2022 sustainability report

0 → 24 MWh

of storage, none in phase one, added in phase two as a choice rather than a prerequisite

02 In the control room, and on your screen



Left: the Loulo control room, SCADA synoptics and the INSTANT camera wall feeding the energy management system. Right: the INSTANT live dashboard, nine sky imagers, the 30-minute forecast, per-camera GHI and cloud motion vectors.

BARRICK
AFRICA POWER SERVICES

"This project is an example of how we partner with suppliers and technology leaders to deliver a world-class project in one of Africa's most remote regions."

Rousseau Jooste, Chief AME Engineer, Barrick

03 How it works

1. Detect

Hemispherical fisheye imagers around the plant capture approaching cloud that satellite imagery, limited to 3 km and 15 minutes, and irradiance sensors do not resolve.

2. Forecast

Algorithms predict the rise or fall in PV output at the second, backed by satellite at 15 minutes and short-term models from 5 minutes to one hour.

3. Act

The forecast reaches the energy management system, which starts or unloads the high-speed diesel units ahead of the event.

04 What the operator gained beyond the fuel

Capex deferred, then chosen

Phase one ran with no storage at all. The battery arrived three years later, sized against a system already known to work.

Reserve kept optimal

Spinning reserve is sized against what is coming, not against the worst case, so fewer engines run for nothing.

Maintenance planned

Operators use the forecast to schedule work on the thermal plant in the windows generation allows.

Scientific backing

Co-developed with the O.I.E. centre of MINES Paris - PSL and ARMINES. Main contributor to IEA PVPS Task 16.

Integrated on site

Delivered with SPIE Industrie & Tertiaire over dedicated priority links, with Africa Power Services as EPCM.

Replicated

A second off-grid mining site, in the Democratic Republic of Congo, is under way on the same principle.

aws **AWS-native platform.** Enterprise-grade cybersecurity: OAuth2, role-based access, encryption, hosted in the region of your choice.

Sources: joint press release with Barrick, Africa Power Services, SPIE, MINES Paris - PSL and ARMINES, December 2022; phase two from CalibSun project records. Loulo delivered by CalibSun's founding team, then operating as Solaïs.