1 Title and idea

Vijayalaxmi + Sakshi | 0:00–1:00

Good morning. We are GFIS EcoTwin from Shri Siddheshwar Women's Polytechnic, Solapur. We address SIH26200 through explainable software for renewable bioenergy management. GFIS EcoTwin is an industry-supported student innovation project developed with technical mentorship from Chatake Innoworks Private Limited. The company provides the existing GFIS research and simulation foundation. Our six-member student team is responsible for the proposed SIH prototype extension, testing and demonstration, including a ROS2 replay bridge, sensor-fault handling and traceable operator events. This distinction keeps the prior platform and the new student contribution explicit.

Handoff

Sakshi: I will show how an observation moves through the system before Sunaina explains the model evidence.

Rehearsal note

Speak naturally; do not read numerical strings without pauses. Say the target and unit before the score. Keep the slide visible during handoffs. Proposed student work, measured history and synthetic simulation must remain distinct.

2 Proposed solution

Vijayalaxmi + Sakshi | 0:50–1:40

This is the existing modular GFIS plant, captured from our local software. Its reactor, mixing, heating, gas holder and energy equipment are inspectable. A student can change a scenario input and see the corresponding state. Our new contribution connects timestamped packets, quality flags and operator decisions to that scene. ROS2 is our proposed integration layer; we are not claiming physical sensors are already connected.

Handoff

Sakshi: The architecture separates measured replay, model inference and simulation.

Rehearsal note

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3 Technical approach

Sakshi, then Sunaina | 1:40–2:40

A packet identifies the plant, timestamp, variable, unit and data quality. We reject or flag missing and stale inputs before any interpretation. Research models use past information only. The scenario engine applies explicit gas-balance checks, and the 3D twin shows the same clock and state. An alert retains its input and explanation so another student can replay the event. Our planned ROS2 bridge will map the packet into this workflow without issuing real actuator commands.

Handoff

Sunaina: To justify a model, we compare it against persistence on chronological data.

Rehearsal note

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4 Feasibility and evidence

Sunaina + Sneha | 2:40–3:50

The full-scale benchmark uses 500,400 one-minute records from one University of Iowa dataset. Its target is the next 24-hour mean total-biogas flow, not continuous methane. Across three rolling folds, LSTM has MAE 13.94 CFM, compared with 16.75 for persistence and 16.77 for XGBoost. XGBoost leads the final period, so we retain that result too. The primary LSTM uses 15 epochs per fit. In the sparse methane task, persistence wins. The existing plant also supports 48-hour synthetic scenarios. These establish software behavior, not 48 hours of industrial operation.

Handoff

Sneha: I will now connect the plant view to the city scenario.

Rehearsal note

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5 Impact and pilot

Sneha, then Samina + Shweta | 3:50–5:00

The city view shows six assumed energy campuses and a regional gas buffer. We can inspect storage, demand and transfer limits, then compare a link outage against the baseline. We will measure forecast error, useful alerts, unserved demand and flared gas in a supervised pilot. The energy calculation on this slide is an assumption-based example, giving 208.74 kWh per day gross; it is not a measured saving. Samina will retain alert and acknowledgement history. Shweta will test timestamped telemetry on a safe low-voltage bench.

Handoff

Shweta: Our final slide identifies the public data and the existing software foundation.

Rehearsal note

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6 References and close

Samina + Shweta; Vijayalaxmi closes | 5:10–6:00

Our public sources include University of Iowa SCADA data, Mendeley reactor records, the interlaboratory methane benchmark and PyADM1. We keep source, target and simulation labels visible. Industry sponsorship gives the team access to an existing research platform and engineering mentorship; it is not presented as SIH endorsement or as proof of performance. Our student deliverable is a tested workflow that handles sensor faults and reproduces the same event in the twin and its log. Thank you. We can now demonstrate the plant, models and city scenario.

Handoff

Vijayalaxmi: Invite questions. If asked about DIPEX, disclose prior GFIS work and explain the new student contribution and SPOC eligibility review.

Rehearsal note

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