JUMPLINK ENERGY SYSTEM INC.

R&D DEVELOPMENT ROADMAP

Pre-pilot component prototyping, laboratory integration and technical validation for a future smart microgrid.

PUBLIC DEVELOPMENT BRIEF

NOVEMBER 2026

PROGRAM OBJECTIVE

Develop and test two principal prototypes - a seven-cell, nominal 100 W vanadium redox flow battery (VRFB) and a DC/AC inverter - together with the power-conditioning, renewable-input simulation, monitoring, control and protection needed for an integrated laboratory demonstration. A larger pilot is a subsequent, separately scoped stage.

ILLUSTRATIVE 12-MONTH SEQUENCE

Month windows are planning assumptions, not confirmed completion dates. Activities may overlap.

01	**SYSTEM DESIGN & SAFETY** Architecture, battery/inverter interfaces, test plan, hazard review and supplier quotations.	M1 - M2
02	**COMPONENT FABRICATION** VRFB stack, electrolyte circuits, inverter hardware, DC/DC modules and test fixtures.	M3 - M5
03	**SEPARATE BENCH TESTS** Battery leak and electrochemical tests; standalone inverter and DC/DC verification.	M5 - M8
04	**LABORATORY INTEGRATION** Regulated DC bus, source simulator, supervisory controls, protection and isolated AC loads.	M8 - M10
05	**VALIDATION & PILOT REVIEW** Document results and risks; decide readiness and requirements for future pilot funding.	M10 - M12

PROTOTYPE WORKSTREAMS

COMPONENTS TO BE DEVELOPED AND TESTED

Each workstream will have its own build, commissioning and evidence requirements. Specific equipment ratings and detailed specifications will be frozen during the engineering phase.

01 VANADIUM BATTERY (VRFB)

7-cell, nominal 100 W / approximately 10 V stack; graphite plates, N115 membranes, felt electrodes, two electrolyte circulation loops.

EVIDENCE TARGET

Leak checks; logged voltage, current, flow and charge/discharge data.

02 DC/AC INVERTER

Standalone inverter prototype for regulated AC output into isolated laboratory loads. Topology, power and voltage ratings remain open.

EVIDENCE TARGET

Recorded waveform, regulation, efficiency and fault response.

03 DC/DC + DC BUS

Power-conditioning interface to match low-voltage battery output to a controlled bus; isolation and bidirectional power transfer as required.

EVIDENCE TARGET

Verified electrical compatibility and controlled power transfer.

04 RENEWABLE INPUT

Controllable PV/DC source simulator and interface for exploring variable renewable-energy supply in a laboratory setting.

EVIDENCE TARGET

Stable operation across representative input scenarios.

05 CONTROLS & MONITORING

Instrument battery, converter and inverter; data logging, command sequencing, alarm management and safe shutdown logic.

EVIDENCE TARGET

Traceable logs, operating sequences and fault records.

06 SAFETY & TEST LOADS

Acid containment, leak response, isolation/disconnects, protection, thermal monitoring and appropriately rated isolated AC test loads.

EVIDENCE TARGET

Reviewed safety procedures and demonstrated protective functions.

VALIDATION & NEXT STEPS

EVIDENCE-BASED DEVELOPMENT GATES

Each milestone should be supported by documented tests and a review decision. The gates below are proposed acceptance criteria, not claims of completed work.

GATE	REQUIRED EVIDENCE	DECISION
G1	Design / bill of materials / safety plan reviewed; key supplier quotations received.	Release controlled fabrication.
G2	VRFB initial operating data; inverter and DC/DC separately bench-tested with traceable records.	Authorize controlled integration.
G3	Demonstrated power routing, logging, protection response and stable isolated-load operation.	Authorize repeatable system testing.
G4	Performance report, limitations, updated cost model, pilot requirements and risk register.	Consider a separate pilot proposal.

FUNDING AND SCOPE BOUNDARY

CAD $250,000

PRELIMINARY FUNDRAISING OBJECTIVE

This amount originated as an early R&D; planning target. Its sufficiency for both the VRFB and inverter plus supporting microgrid modules is not yet validated. A combined costed bill of materials, labour plan and supplier quotations are required before confirming the financing ask.

BEFORE APPROVING A LARGER PILOT

Technical: repeatable, documented tests and reviewed safety controls. Commercial: preliminary economics, integration partners and candidate applications. Financing: a separate pilot scope, budget, timetable and funding approval.

Public R&D planning document. Technical targets are not verified results; no offer to sell securities is made.