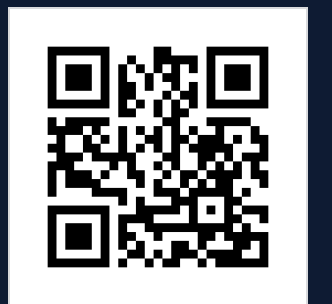


— EU-ISMET 2026 · TOULOUSE

Reading 10,000 MES papers with AI — and what it means for your next experiment

Sam Frons · messai.io · 12-minute talk



MESSAI.IO/SURVEY

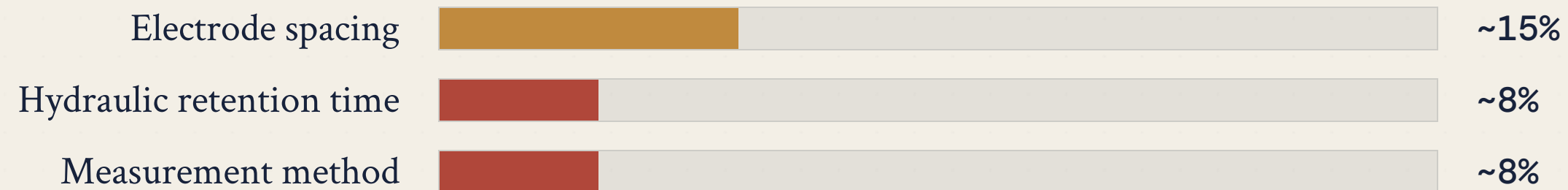
Reported power density spans five orders of magnitude.

1,285%

COEFFICIENT OF VARIATION · 0.003 → 10,144,200 MW/M²

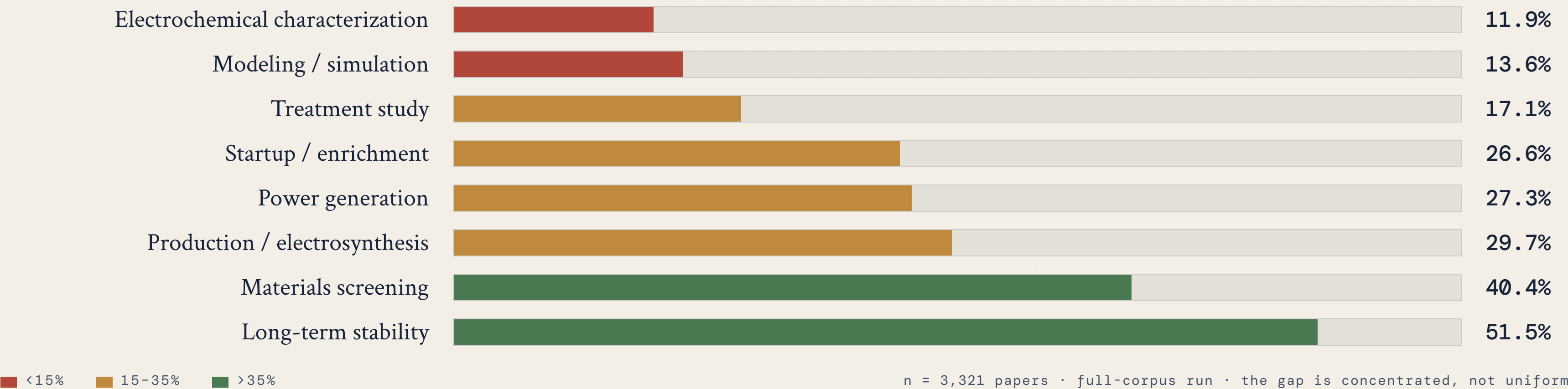
Most of that spread **isn't biology** — it's missing metadata.

Average reporting completeness: *23.1%*



These aren't exotic parameters — they're the ones every one of us already records. They just **don't reach the methods section.**

Scored against *each study type's own* minimum-reporting set



94%

NEVER STATE WHICH AREA IT'S NORMALIZED TO

Anode, cathode, membrane, or projected — these differ by orders of magnitude. That one omission is the dominant driver of the five-order spread. The ask isn't "report more" — it's **report the interpreters** of the number you already publish.

"Acetate MFC, carbon-felt anode — how does spacing affect power?"

TODAY

3 months

A manual literature review — and you still can't trust the comparison.



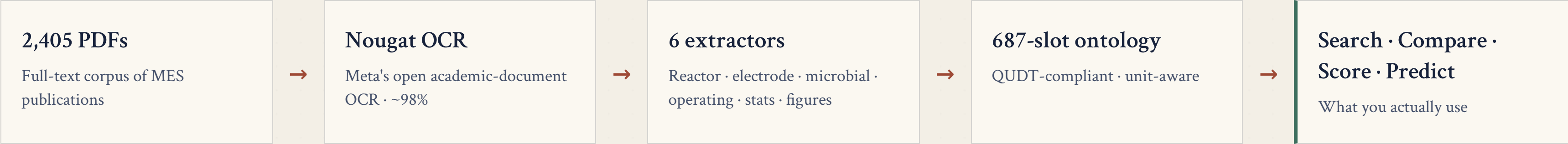
SHOULD BE

3 minutes

A search box, with the parameters already filled in.

AI is what closes that gap. Here's how.

An *open pipeline*: PDFs → ontology



F1 = 94.2% K = 0.91 UNIT ACCURACY 99.7% ALL OPEN · [GITHUB.COM/MESSAI-IO](https://github.com/messai-io)

Every value carries its *source, confidence, and a way to flag it*

496.4 mW/m²

SOURCE · p.4, Fig. 3b · "max power density of 496 mW/m²..."

EXTRACTOR · electrode-v2 · 2026-05 · CONFIDENCE 0.91

▀ FLAG INCORRECT

No number in MESSAI is unattributable. That's the line between **infrastructure you can cite** and a chatbot you can't.

Surfacing isn't *confirming*

183,615 candidate correlations surfaced

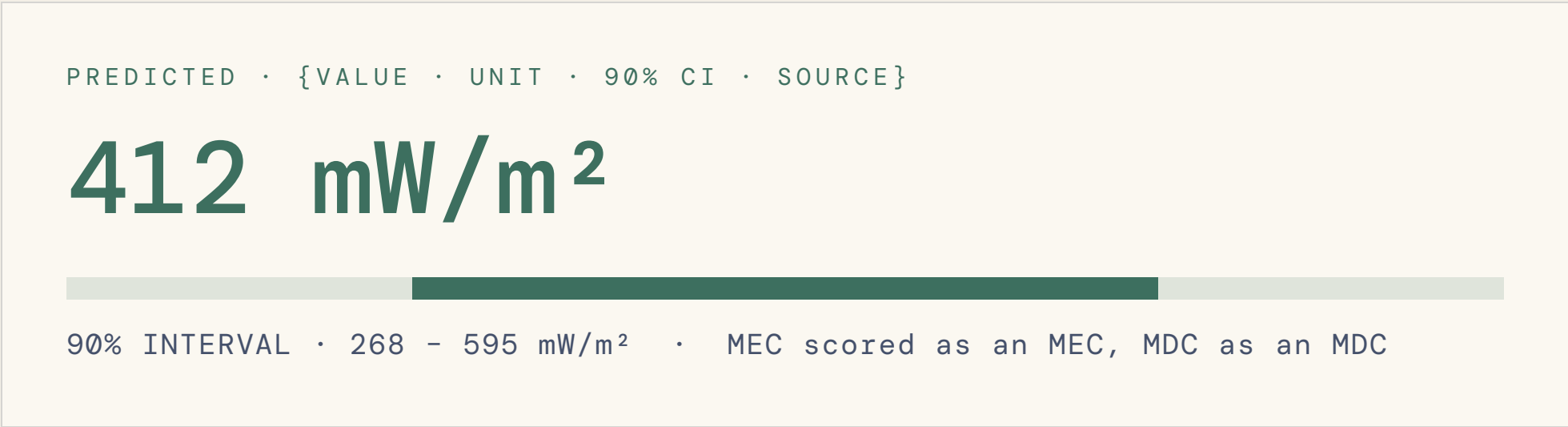
14 tested rigorously (Student's t)

2 survive Bonferroni —
exploratory

CAVEAT

Bonferroni $\alpha = 3.6 \times 10^{-3}$ · $r \approx 0.57$ · $n = 36, 55$ · confounds uncontrolled. The confirmatory study is community work — and I'd like your help running it.

Physics-first, per-system-class, *calibrated*



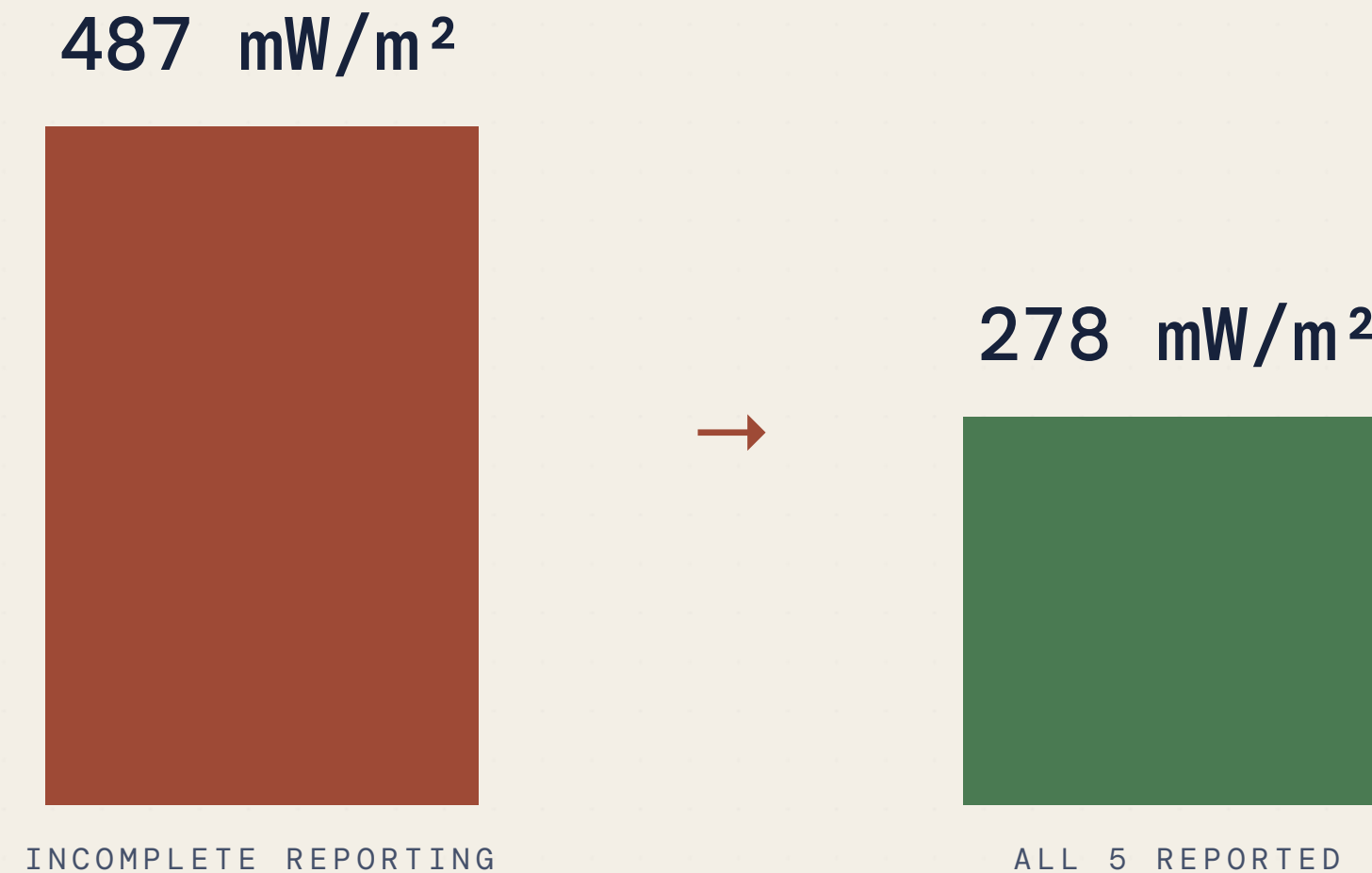
Every prediction ships a calibrated interval and a source. **When it doesn't know, it says so.**

The 5-parameter *minimum checklist*

01 Electrode spacing	02 Electrode surface area + normalization basis	03 External resistance	04 Measurement method sweep vs steady-state	05 Unit normalization basis areal vs volumetric
--	--	--	--	--

You already have all five **in your notebook** — every reviewer can check them in a minute.

Papers meeting all five → *43% lower* power-density IQR

**CAVEAT**

Retrospective, observational, $n = 63$ ($p < 0.05$). Associational, not causal — the clean test is a prospective intervention study.

Let's open the platform.

[/research](#) — search, provenance, flag-incorrect · [a worked paper](#) — 3D geometry + params beside the table ·
[/tools/reproducibility](#) — paste a DOI, get the score · [/lab](#) — a calibrated prediction with its CI band.

Five patterns you can use *this year*

- 01 Triage the literature at scale — months → an afternoon
- 02 Structure your own old papers & notebooks — rules + LLM + human check
- 03 Self-score a manuscript — before you submit
- 04 Predict before you build — demand calibrated intervals
- 05 Share FAIR data — every contribution improves every tool

It only works if *enough of you plug in*

01 · 30 SEC

Verify your own paper

Paste a DOI at messai.io, flag errors.

02 · GITHUB

Claim an ontology category

Own the slots your group knows best.

03 · REVIEW

Pilot the 5-param checklist

We give you the copy-paste comment.

04 · STUDY

Run the intervention study

Pre-registered special issue; we score it.

Scan → the 60-second survey · messai.io/survey



[MESSAI.IO/SURVEY](https://messai.io/survey)

The literature we've published is the *substrate*. MESSAI
is a first attempt at a shared *electrode*.

messai.io · sam@messai.io · Thank you.



TELL US WHAT TO BUILD NEXT