

The Journal of Process and Energy System Integration Models - Proposal for Consortium Discussion

Administrative, Technical, and Financial Framework in Collaboration with PSE Press

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Warning

This is a preliminary **DRAFT** version

Executive Summary

The **The Journal of Process and Energy System Integration Models** is proposed as a **peer-reviewed, open-access platform** for sharing validated process and energy system integration models.

The journal is available [here](#).

Key features:

- **DOIs** for all models via **PSE Press** and **Crossref**.
- **Standardized documentation** (inputs, outputs, validation, metadata).
- **Models** shared as supplementary electronic information
- **Editorial Board** by the partners of the IETS Task XXIV consortium
- **Peer review** to ensure scientific rigor and reproducibility.
- **Budget**: \$26,000–\$50,000/year for administrative and technical costs.
- **LLM bot integration** for natural language queries.

Next Steps:

1. Validate concept, budget and framework with the consortium.
2. Finalize agreement with PSE Press.
3. Launch pilot phase (Q4 2026).

Objectives & Scope

Sharing models is not just sharing the data files for a calculation engine and the associated data values needed to run the model and generate useful results, it also means documenting the model, defining its inputs (or manipulable variables), reporting the data used by the models and their assumptions, explaining how to use the model and how to interpret and report the model results and how to share the data generated.

The goal of the journal is publish this set of information that defines a shared model.

Our work inspired by the [Alan Turing way](#), a web site that comments and documents the reproducible, ethical and collaborative data science methodology. Visit the site to learn more about this concept.

We propose to use (but not limit to), the [quarto manuscript concept](#) for developping articles of the journal with embeddings of models.

The manuscripts website is hosted [here](#).

Why a Dedicated Journal?

Current Challenges:

- Models shared ad-hoc (email, private repos) with **no standardized model documentation**. Sometimes the use of the model is associated with a scientific publication but the model description is not the core of the paper and therefore it is difficult to reuse and to validate the models.
- **No formal recognition** (no DOIs, peer reviews) → limited citation and impact.
- **Reproducibility issues** due to missing metadata or input data.
- **Process or Energy System integration (i.e. mass, heat and energy exchange interface)** is not well reported which prevents its reuse for process and energy system engineering applications.

Solution:

A centralized, peer-reviewed journal that:

Assigns **DOIs** for citation and permanence.

Enforces **standardized templates**.

Ensures **long-term accessibility** (archiving by PSE Press). Gives access to **the models** (software tools data bases shared). Gives access to **integration data sets** as sets of integration data standardized and documented in the paper. Enables **LLM-based discovery** of models.

Scope:

- Technology/process/equipment/system-level models (e.g., pyrolysis, heat pumps, district energy).
- **Exclusions:** Non-energy models, unvalidated models, proprietary models.

Budget & Funding

i Note

This needs to be discussed, values are LLM guesses

Estimated Annual Budget: \$26,000–\$50,000

Category	Cost (USD/year)	Notes
Journal Management (OJS)	\$5,000–\$10,000	Hosting, maintenance, updates.
DOI Registration (Crossref)	\$1,000–\$3,000	~\$50–\$100 per DOI.
Database Hosting	\$3,000–\$7,000	Cloud storage + vector DB (e.g., Weaviate).
Editorial Support	\$10,000–\$15,000	Part-time assistant.
Technical Support	\$5,000–\$10,000	GitHub/Zenodo integration, LLM bot.
Contingency	\$5,000	Unforeseen expenses.

Funding Options:

1. **Consortium Budget** (Preferred for pilot phase).
2. **Hybrid Model:** Consortium (50%) + Sponsorships (30%) + Publication Fees (20%).
3. **Publication Fees:** \$200–\$500/model (waived for IEA members).

Collaboration with PSE Press

Why PSE Press?

- **Proven infrastructure:** Open Journal Systems (OJS) for peer-reviewed journals.
- **DOI registration:** Via Crossref for permanent, citable links.
- **Long-term archiving:** 10+ year preservation.
- **Technical support:** Metadata standards, repository integration, LLM bot development.
- **Academic visibility:** Indexing in Scopus, Google Scholar.

Proposed Agreement

- **Scope:** PSE Press provides publishing infrastructure (OJS, DOI, archiving). IEA Task retains **full editorial control**.
 - **Cost:** \$20,000–\$30,000/year for PSE Press services.
 - **IP:** Authors retain copyright (default: CC-BY-4.0).
 - **Term:** 3-year agreement (1-year pilot phase).
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Publication Workflow

1. Author Submission

- Use the [Model Template \(Quarto\)](#).
- Include: Model description (PDF/HTML), code, input/output files, metadata, bib, README.
- Submit via IEA Task Model Journal Portal via a git system.

2. Peer Review

- 2–3 reviewers nominated by the members of the editorial board (IETS Task XXIV members/external experts).
- **4-week review period**; authors have **4 weeks for revisions**.
- **Criteria:** Completeness, [TaskXXIV methodology](#) compliance, mass/energy balance validation, input and output parameter documentation, functionality, bibliography.

3. Publication

- Editorial board approval → PSE Press assigns **DOI** and publishes.
- Model archived in **IEA Model Database**; metadata indexed for LLM queries.

4. Versioning

- Each approved version gets a **DOI**.
 - Minor updates (bug fixes) → patch versions (e.g., 1.0 → 1.1) **without peer review**.
 - Major updates (new methodology) → **peer review + new DOI** (e.g., 1.0 → 2.0).
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Metadata Schema

Required for LLM Integration: Standardized metadata in **YAML/JSON** format.

Example (metadata.yaml):

```
---
title: "Pyrolysis Model for Biomass Conversion"
authors:
  - name: "John Smith"
    affiliation: "University X"
    orcid: "0000-0000-0000-0000"
doi: "10.5281/zenodo.1234567"
version: "1.0"
license: "CC-BY-4.0"
model_type: "Process Model"
equipment:
  - name: "Fluidized Bed Reactor"
    size: "500 kg/h"
    cost: 50000
inputs:
  - name: "Biomass Flow Rate"
    unit: "kg/h"
    range: "100-1000"
outputs:
  - name: "Biochar"
    unit: "kg/h"
```

```

- name: "Syngas"
  unit: "m³/h"
heat_exchange_interface:
  type: "Shell-and-Tube"
  hot_fluid: "Syngas"
  cold_fluid: "Water"
validation:
  mass_balance_deviation: 0.05 # %
  energy_balance_deviation: 0.8 # %
references:
- doi: "10.xxxx/abcd"
  description: "Validation study for pyrolysis models"
publisher: "PSE Press"
journal: "IEA Task Model Journal"
repository:
  url: "https://github.com/IEA-Task/pyrolysis-model"
  doi: "10.5281/zenodo.1234568"
---
```

LLM Bot Integration

- **Purpose:** Enable natural language queries (e.g., “Show me all pyrolysis models with a heat exchanger”).
 - **Technical Stack:**
 - **Vector Database:** Weaviate/Pinecone for semantic search.
 - **RAG (Retrieval-Augmented Generation):** Retrieves relevant models and generates responses.
 - **Example Queries:**
 - “What is the efficiency of the heat pump model?”
 - “Give me the metadata for the latest gasification model.”
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Timeline

Phase	Tasks	Deadline	Responsible
Consortium Validation	Discuss proposal, validate budget.	2026-07-15	IEA Task Consortium
PSE Press Agreement	Finalize and sign agreement.	2026-08-01	IEA Task + PSE Press
OJS Setup	Configure Open Journal Systems.	2026-08-15	PSE Press
Pilot Phase Launch	Open submissions, publish first models.	2026-08-16	Editorial Board
LLM Bot Development	Develop and test LLM bot.	2026-09-30	PSE Press / IT Support
Full Launch	Official launch and promotion.	2026-10-16	IEA Task + PSE Press

Open Questions for Consortium

1. **Budget:** Is the proposed budget (\$26,000–\$50,000/year) acceptable? Should we reduce costs (e.g., self-host database, use Zenodo for DOIs)?
 2. **Funding Model:** Preference for consortium budget, hybrid model, or publication fees?
 3. **PSE Press Role:** Comfortable with PSE Press as the publishing partner? Alternatives to consider?
 4. **Editorial Roles:** Who should be Editor-in-Chief and Editorial Board members?
 5. **Versioning:** Should all revisions require peer review, or only major updates?
 6. **LLM Bot Access:** Publicly accessible or restricted to IEA Task members?
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Next Steps

- **Review this proposal** and provide feedback by **2026-07-10**.
- **Attend discussion meeting** on **2026-07-15** to vote on budget, PSE Press collaboration, and workflow.
- **Volunteer for roles** (Editorial Board, reviewers, technical support).

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