

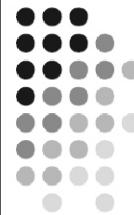
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## The Science and Art of Archival Engineering Publication



Noam Lior  
Editor-in-Chief

ENERGY – The International Journal;  
Regional Editor for North America and Europe,  
ENERGY CONVERSION AND MANAGEMENT  
lior@seas.upenn.edu



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### Abstract

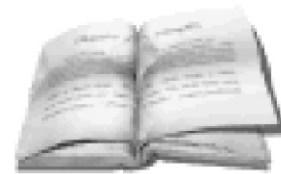
This talk starts with a discussion of the benefits of archival publication in engineering science, which are both to international advancement of the state of technology and science, and not the least to the career and opportunities of the authors themselves. A further benefit is the associated approval and ratification of the archivally-published work by the international engineering and scientific community through the expert review process. A recommended structure of the paper is described, which in fact is best prepared even before the start of the reported research, to optimize the research/development methodology and facilitate the eventual archival publication of the outcome. The important role of the background review and reference citations, and of error analysis, is described. Observation of details such as clarity of expression in the journal language, required format, the role and quality of tables and illustrations, the way to write an abstract and conclusions, nomenclature, and use of units, are explained. Ways to respond to reviewers' comments, communicate with the editorial staff, and to maximize the chance for paper acceptance, are discussed.

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## ENERGY: scope and key statistics



- **Scope:** (a) "A multi-disciplinary focus for activities relating to the development, assessment and management of energy-related programs" (*Energy's* Aims and Scope); and (b) "uniquely among energy related journals, it publishes papers in all fields of energy: science, technology, economics, policy, forecasting, environmental and social impact, sustainability..."
- **Size:** 240+ papers published per year in (a) 12 regular monthly issues; (b) 2-3 special issues for 10-20% papers selected from high quality conferences; and (c) 1-2 special issues for invited papers on hot topics (e.g., electricity deregulation) chosen by the Editor-in-Chief.
- **Review process:** (a) anonymous review by typ. 3 reviewers; (b) average 1-2 revisions before final decision; (c) below 50% acceptance rate for regularly received papers; and (d) average 10.5 months from initial submission to electronic availability of an accepted paper on *Energy's* website.



**The only major energy journal that considers and publishes papers from all energy related disciplines: diverse interdisciplinary readership**

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## Benefits of scientific writing



- Contribute to international progress of the state of technology and science,
- The associated approval and ratification of the archivally-published work by the international engineering and scientific community through the expert review process
- Advances the reputation of the author's institution/company/nation
- Advances the career and opportunities of the authors themselves:
  - Promotion in author's workplace
  - Improved opportunities for winning research grants and contracts
  - New job opportunities
  - Improved opportunities for getting consulting work
  - A portable public record of accomplishment
  - The various other benefits of becoming better known

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## The global village



- With the amazing growth in quantity, variety, speed and quality of extremely cheap electronic communications worldwide, information becomes widely accessible, very fast. This is strongly assisted by the electronic publishing.
- This can also promote national and international cooperation
- Information quality control is, however, much more difficult, and therefore peer reviewed archival publication becomes much more important in this electronic age.
- Keep in mind that what you wrote or did in, say, Niš (or Kragujevac, or Novi Sad, or Philadelphia) can become rapidly known worldwide in the form of text, photos, movies, or sounds...)

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## Ethics



- Each submitted paper must include a statement that "this paper has not been published previously, it is not under consideration for publication elsewhere, and if accepted it will not be published elsewhere in substantially the same form, in English or in any other language, without the written consent of the Publisher."
- Authors must also agree to the more detailed "Ethics statement" of Elsevier during the submission process  
[http://www.elsevier.com/wps/find/intro.cws\\_home/ethical\\_guidelines#Duties%20of%20Authors](http://www.elsevier.com/wps/find/intro.cws_home/ethical_guidelines#Duties%20of%20Authors),
- Violation of ethical requirements may be damaging to the author's career, AND WASTE A LOT OF TIME OF THE PUBLISHER AND EDITOR
- Papers that the author might have copyrighted elsewhere, such as in a conference, must be accompanied by an official release by the copyright owner.

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## Don't even think about:



- Plagiarizing other people's work; in fact be extra careful to acknowledge sources
- Not including as co-authors those who contributed significantly to the work
- Submitting the paper to more than one journal at the same time
- Concealing conflicts of interest

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## Paper topic and title



- Make sure it fits within the journal scope
- ENERGY considers all papers dealing with energy
- The title should be descriptive ***of what is reported in the paper***, but not too long, in good jargon-free English
- If abbreviations (acronyms) are used in the title, they must also be expanded (unless they are very common internationally, such as USA, EU, Ph.D., Gestapo, Scuba, Laser)
- In the title, authors' first name, last name: Josip Broz, not Broz, Josip or Josip BROZ

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## The outline



- Imagine who the readers would be: editor, reviewers, and general audience if the paper is published
- Then put yourself in their place when composing and writing the paper: would they understand it and its contribution easily?
- Prepare a careful and detailed outline of the paper before writing it, usually as follows:
  - Introduction
  - Scope/description of the research
  - Method of the research
  - Results
  - Discussion and validation of the results
  - Conclusions
  - Acknowledgments
  - References
- It helps in your research if you prepare the paper outline even before you start the ultimately reported research

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## The abstract



- This is an extremely important part of the paper because:
  - It summarizes the entire paper; it is the public's window to your work
  - It may be the only part of your paper that many people read
  - It is much more available publically than the paper itself
- Typical composition is:
  - Motivation for the paper
  - Objectives
  - What was done
  - How it was done and validated
  - Major results
  - Conclusions
- Be quantitative
- Write it clearly and in very good English
- Do not exceed the imposed length limits, typ. 150-200 words

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## Introduction



- Statement of need for the study
- Its contribution to state of the art in view of past published work
  - Brief but quantitative review of the state of the art that is written topically, not chronologically
  - Avoid general statements such as "...the subject was studied in [17]–[44]." that puts in doubt whether you actually read and understood these papers; make specific comments on the past work as it relates to your study
  - The contribution of the paper has to be significant and not just a marginal addition to past work
- Clear objectives of the study, that also must be met in the paper

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## Language and format



- While ENERGY recognizes that the authors come from different native languages, and thus doesn't expect perfect English,
  - The language expression should be technically clear and precise
  - Very poor usage of the language, even if technically clear, diminishes the Reviewers' respect to the paper
  - Always use the same expressions for a concept as it is used repeatedly in the paper
- Follow the journal formatting guidelines strictly to avoid returns, revisions, waste of your time, and negative reactions by the Reviewers' and editors
- Use . and not , for the decimal point; also 0.5, not .5

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## Error analysis: Mandatory!



- All papers using modeling, simulation, or/and computation, *regardless of whether they are commercial packages or developed by you*, must include a thorough formal error analysis, such as validation with respect to reality. As applicable to the specific modeling/simulation method used, include discussion of such items as:
  - modeling error
  - solution convergence
  - grid dependence
  - examination of satisfaction of conservation laws
  - input data errors and sensitivity of the results to these errors
  - others as appropriate for the problem and solution method.
- All papers reporting experimental or computed results must contain a thorough formal error analysis:
  - detailed description of the measuring instrumentation and how they were installed,
  - calibration
  - errors of individual measurements and combined errors of results which used more than a single instrument for their determination
  - statistical aspects, etc.
- For clarity, it is best to include the error analysis as a separate subsection or section in the paper, within the section describing the experimental procedure.

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## The use of illustrations (Figures)



- "One Picture is Worth a Thousand (or Ten Thousand?) Words"
- Figures must be very clear and any lettering in them of about the same size as in the text
- It is very useful to prepare a qualitative display of your planned graphs even before starting the research: what do you wish to plot against what?
- Journals print color figures only if paid (>\$500/page), but many would publish color figures for free in the electronic version of the published paper (ScienceDirect)
- If you choose not to pay for color printing, make sure that the figures are highly legible when printed in b/w

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## Conclusions and recommendations



- Very briefly summarize the most important conclusions about the
  - Results
  - Explanation of the results
  - The research method (if of interest)
- Any recommendations that evolve from the paper
- Sometimes it may be useful to start this section by explaining what was done and how
- Do not bring up new results in this section, it should be based on what was reported in the earlier parts of the paper
- It is not recommended to state here that the authors are planning continuation of this work or that another paper is in preparation; you may win the lottery or run away with a dashing billionaire, and that would disappoint the readers...

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## References and citations



- Follow the required format exactly and include sufficient information so that interested readers could easily access the reference; this includes addresses for reports and theses, verified web sites (with verification date), publisher's address (except for journals), etc.
- Elsevier offers to authors a possibility to upload a large amount of information related to their paper, including, text, data, programs, illustrations, and entire references that are otherwise hard for readers to access, separately on its ScienceDirect (SD) web site, that can be accessed when readers click on a link in the SD electronic version of the paper. This information would be available only on SD, not inside the paper.
- In citing your own past work, make sure to cite all directly related publications (past, **and those submitted**), but not weakly-related ones

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## Choice of journal



- Obviously the work should be one of the topics mentioned in the scope of the journal
- The journal should one that reaches the largest number of readers who may be interested in your work; This is hard to quantify but is usually found by word-of-mouth from experts
- The best known criterion for evaluating journal quality is the **Impact Factor**, which is unfortunately
  - Far from perfect
  - Overused
  - Misused

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## The Impact Factor (IF)



- The journal impact factor for a particular year is a measure of the number of citations in that year to an article published in the two years preceding that year.

$$IF(x) = \frac{\left\{ \begin{array}{l} \text{Number of citations in most of the relevant journals in year } x \\ \text{to papers published in that journal in years } (x-1) \text{ and } (x-2) \end{array} \right\}}{\text{Number of papers published in that journal in years } (x-1) \text{ and } (x-2)}$$

- For example, the 2006 impact factor is the *number of all citations in the world scientific literature* in 2006 to articles published in that journal during 2004+2005, divided by the *number of articles* published in that journal during 2004+2005. For example, if there were 96 citations in 2006 for 100 articles published in a journal in 2004+2005, its 2006 impact factor would be 0.96.
- The impact factor increases if:
  - More of its papers are cited in journals
  - Paradoxically, if fewer papers are published by the journal in that period. Increasing the number of published papers in 2004+2005 reduces the IF at least for 2006 because the citations may be delayed.
  - The papers are on "hot" topics, or reviews, almost independent of their quality.
  - Since only the named 3-year period is considered, quicker publication of a paper in a hot topic allows time for more citations
- Many deficiencies:
  - it reflects only the impact on those who publish papers, and does not reflect possible interest by practical users of the information, such as industry, who usually don't publish papers.
  - Self-citations count, so more self citations raise the IF, and if the paper has several authors they all can self cite in their other papers.
  - It is inherently very different in different fields (e.g., medical journals always have much higher IF than others, and not because they are better)
  - For more see [http://en.wikipedia.org/wiki/Impact\\_factor](http://en.wikipedia.org/wiki/Impact_factor)

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## Communications with the editor



- Editorship is typically a secondary job of an expert who primarily does something else for a living and is not paid for all or any of the time he/she invests; The publisher pays typically only for direct expenses, miserly
- Editors are therefore not usually available to teach authors individually about writing and submitting papers; read all instructions carefully before asking questions
- To avoid wasting the authors' and editors' time and to increase the chances of acceptance, the research supervisor experienced in archival publication should actively participate in the first few submissions of an inexperienced colleague/student.
- Some authors ask the editor to accelerate the review process because they have some special needs: this is not fair to other authors
- Recognize that usually most of the time required for the review process is the time it takes reviewers to respond

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## Response to the reviewers



- When receiving the reviews, the author must always
  - Conduct an objective self-evaluation
  - Be grateful for experts' comments (unpaid!) that may improve his work and at least provide an evaluation on where it stands relative to the state of the art
- The reviewers are typically experts in the field, invited by the Editor
- They are not paid for their work in all journals I am familiar with
- They review papers as part of an informal scientific community understanding that they should:
  - Contribute to the advancement of the state of the art in their fields
  - Compensate the field for work that was done on papers they published
- Respond thoroughly and respectfully to each comment; It is ok to disagree but then provide detailed justification
- If you can make a reviewer's life easier, he/she is likely to be more helpful

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## Navigating the on-line submission and review system



- The first time is always more difficult, but be patient because:
- It saves authors, reviewers and editors a A LOT of time, e.g., it accelerated publication at least 3-fold after introduction in ENERGY (Elsevier's EES) a few years ago
- Most of the journal online systems are accompanied with rather good and free support people; contact them if you have any problems submitting or accessing papers, not the editorial office (we are just as ignorant as the authors are...)
- A common problem is that an author's server does not allow downloads from unapproved sources, this should be resolved with the server administrator, not the publisher