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2009 : October 2009 - Fast Breaking Papers : Marc A. Rosen, Ibrahim Dincer, & Mehmet Kanoglu Discuss Exergy Methods

**FAST BREAKING PAPERS - 2009**

October 2009



**Marc A. Rosen, Ibrahim Dincer & Mehmet Kanoglu talk with ScienceWatch.com and answer a few questions about this month's Fast Breaking Paper in the field of Social Sciences, general.**



**Article Title: Role of exergy in increasing efficiency and sustainability and reducing environmental impact**

Authors: Rosen, MA;Dincer, I;Kanoglu, M

Journal: ENER POLICY, Volume: 36, Issue: 1, Page: 128-137, Year: JAN 2008

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**SW: Why do you think your paper is highly cited?**

The paper describes how exergy methods, which are based on the second law of thermodynamics, can be used successfully in increasing efficiency and reducing environmental impact.

With the ever-increasing concern over global warming and the negative effects of fossil fuel use, this method can provide a means to tackle this problem in a scientifically sound manner. This ability was demonstrated in the paper in a way that can be understood by people in non-technical (i.e., social) fields as well as by scientists and engineers.

**SW: Does it describe a new discovery, methodology, or synthesis of knowledge?**

In the paper, a new sustainability index is developed as a measure of how exergy efficiency affects sustainable development. It was shown that as exergy efficiency approaches 100%, emissions are minimized and the sustainability index approaches infinity (i.e., the use of resource becomes sustainable).

**SW: Would you summarize the significance of your paper in layman's terms?**

The reported work aims at providing a tool for understanding facets of sustainability, which complements other such techniques, in hopes that it can help bring human activity nearer to being sustainable now and in the future.

**SW: How did you become involved in this research, and were**

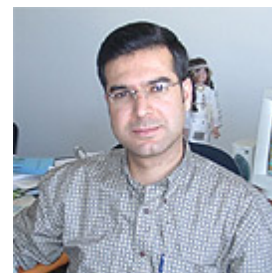


Coauthor  
Ibrahim Dincer

## there any problems along the way?

Mehmet Kanoglu:

I was involved in this research during my sabbatical stay in 2006-2007 at the University of Ontario Institute of Technology in Canada, where I was hosted by Professors Marc Rosen and Ibrahim Dincer. This was a great experience for me, which also proved to be a very productive period in terms of research. We worked as a perfectly coordinated team during this research, allowing much progress to be made in a short period of time.



Coauthor

Mehmet Kanoglu

## **SW:** Where do you see your research leading in the future?

Mehmet Kanoglu:

I continue to do research in various fields of advanced energy systems including the use of exergy methods for efficiency improvements of energy conversion systems. The feasible and effective use of renewable energy sources in a possible future hydrogen economy, energy efficiency improvements, and energy savings are some of the other topics on which my research may concentrate in the future. Presenting the outcomes of my research with co-workers in various media to tackle environmental and social problems is something I value deeply, and I hope to do more of this in the future.

## **SW:** Do you foresee any social or political implications for your research?

The results of our research in this paper suggest that exergy should be utilized by engineers and scientists, as well as by decision and policy makers who are involved in green energy technologies, in tandem with other objectives and constraints. We believe that in the future, exergy methods will be used more commonly by politicians and other people in non-technical fields.

This will only be possible if we develop and formulize better and more straightforward methods derived from exergy suitable for use by other people. This paper was an example of one approach to this goal, and suggests that we will see social and political implications of this and similar studies in the future.

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KEYWORDS: ENERGY; EMISSIONS.

*Related information:*

**IBRAHIM DINCER** - *from the University of Ontario Institute of Technology*



Prof. Dincer discusses how the use of exergy combines the conservation of mass and conservation of energy principles together with the second law of thermodynamics for the design, analysis, and performance improvement of energy systems. **Read** the complete Emerging Research Fronts comment, Aug. 2007 (podcast added Dec. 2007). Listen: [MP3](#) | [WMA](#)

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