Integrarea soluțiilor digitale pentru controlul parametrilor de funcționare în instalațiile de producere a energiei electrice şi căldurii cu zero emisii de CO_2

- Etapa 4 a cercetării –

(perioada iulie – decembrie 2024)

Echipa de cercetare:

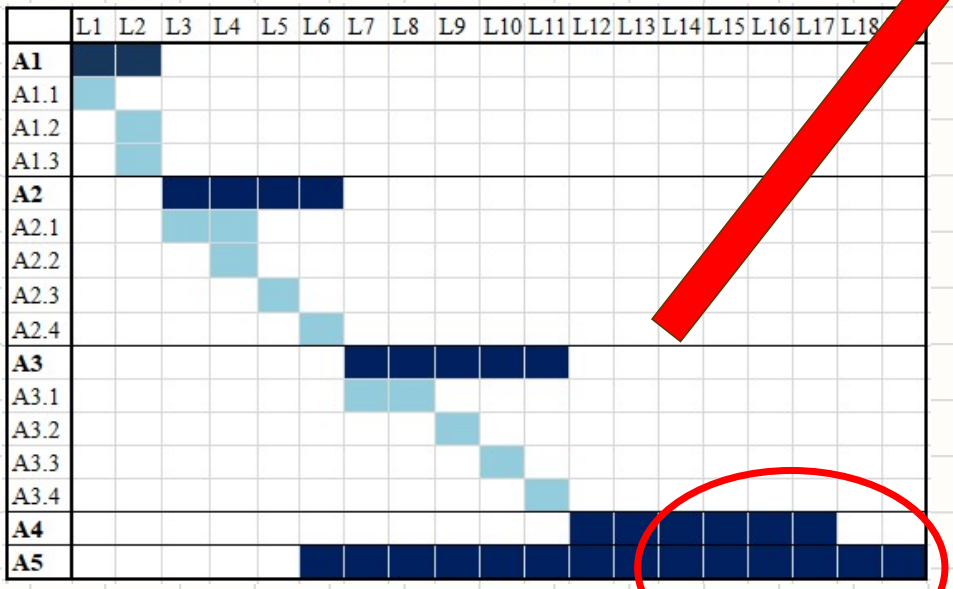
As. dr. ing. Daniel DIMA

Conf. dr. ing. Cătălina DOBRE - *Director proiect*

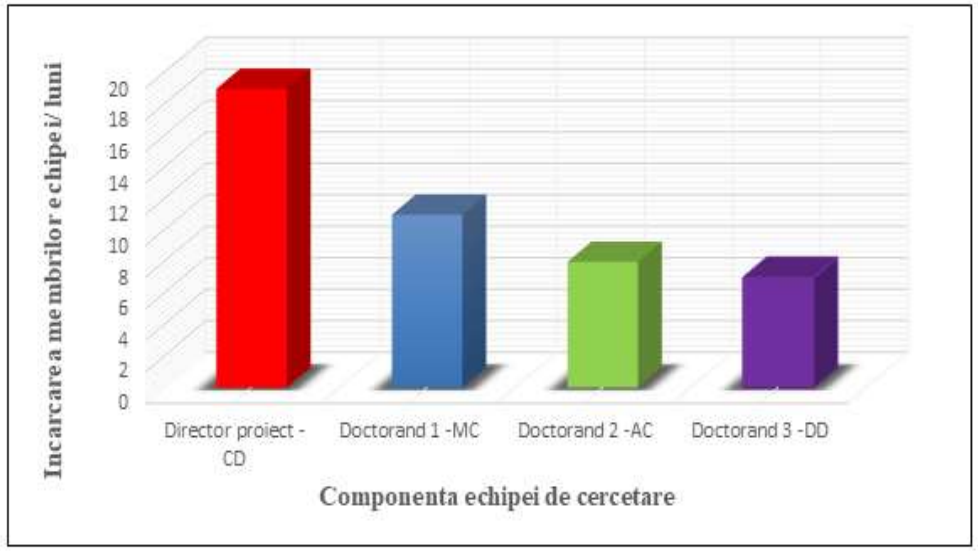
Drd. Ing.Adalia CHELMUS

Drd. Ing. Mihnea COSTIN

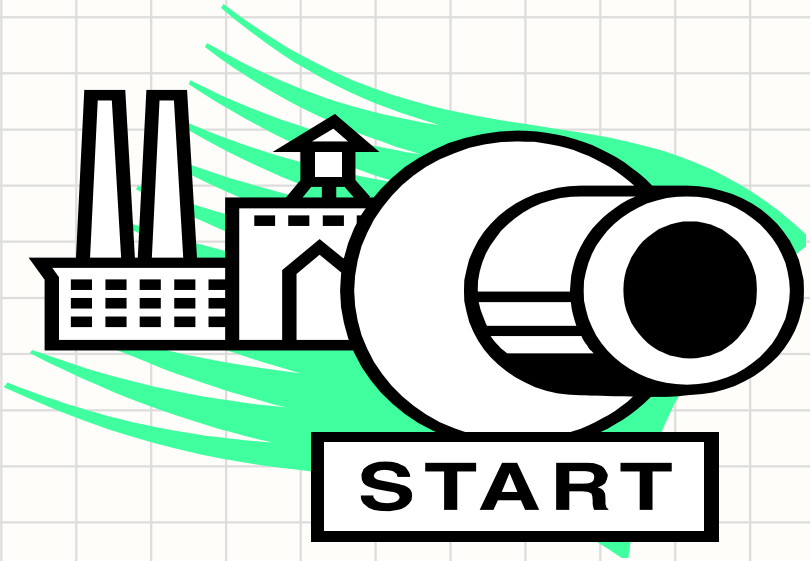
Perioada	Obiective	Activități	Rezultate livrate pe proiect
Iulie 2024– Decembrie 2024	**OS5.** Valorificarea rezultatelor cercetării întreprinse prin publicarea acestora în 2 reviste de renume, indexate WOS şi creşterea vizibilităţii lor prin participarea la cel puțin 2 conferinţe internaționale.	**Activitatea 4.** Analiza sistemului de acumulare a energiei (*Luna12- Luna 17*) **Activitatea 5**. Valorificarea rezultatelor cercetarilor întreprinse cu scopul asigurării vizibilităţii acestora. (*Luna L6-Luna 19*)	✓ 3 articole ştiintifice indexate WOS (cu factor de impact minim 2 şi încadrate minim în zona de influenţă Q2) ✓ 3 participări la conferinţe internaţionale. ✓ 3 articole in reviste WOS in publicare



Graficul Gantt



Gradul de implicare al membrilor echipei de cercetare activitățile proiectului.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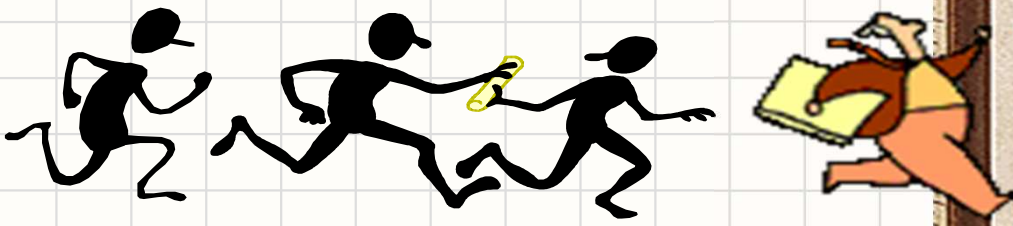
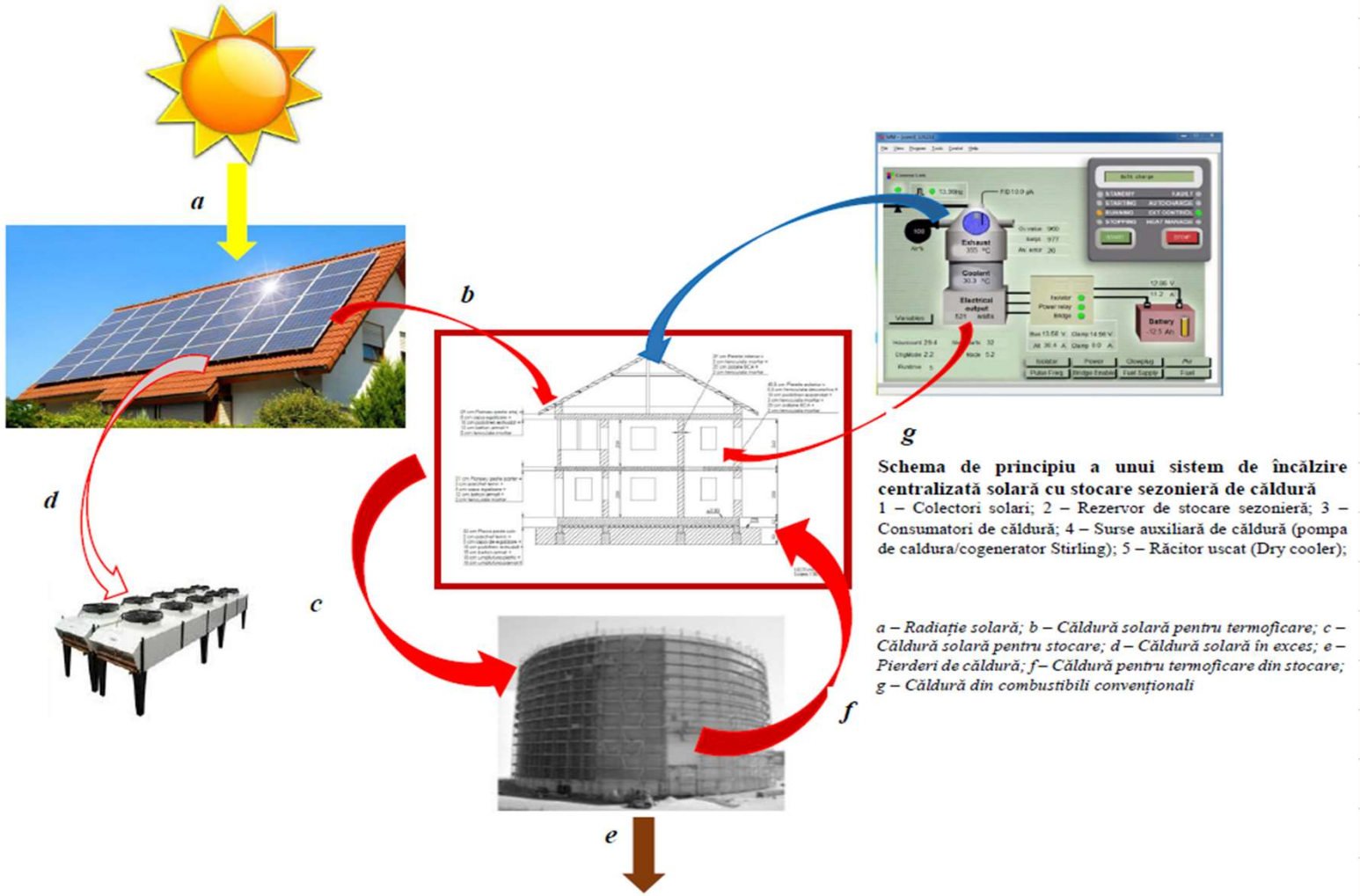


Schema de principiu a sistemului studiat



Schema de principiu a unui sistem de încălzire centralizată solară cu stocare sezonieră de căldură
1 – Colectori solari; 2 – Rezervor de stocare sezonieră; 3 – Consumatori de căldură; 4 – Surse auxiliară de căldură (pompa de caldura/cogenerator Stirling); 5 – Răcitor uscat (Dry cooler);

a – Radiație solară; b – Căldură solară pentru termoficare; c – Căldură solară pentru stocare; d – Căldură solară în exces; e – Pierderi de căldură; f – Căldură pentru termoficare din stocare; g – Căldură din combustibili convenționali

Diseminarea rezultatelor (conferinte) - *etapa1*

Obiective specifice ale proiectului:

OS 5. Valorificarea rezultatelor cercetării întreprinse prin publicarea acestora în 2 reviste de renume, indexate WOS şi creşterea vizibilităţii lor prin participarea la cel puțin 2 conferinţe internaționale.

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A Review on available solutions for implementation of Small-medium combined heat and power (CHP) systems

M Costin[1], A Dobrovicescu[1], L Grosu[2] and C Dobre[1,3]

[1]University Politehnica of Bucharest, Faculty of Mechanical Engineering and Mechatronics, 313 Splaiul Independenței, 060042 Bucharest, Romania
[2]Université Paris Nanterre, IUT Ville d'Avray, Nanterre, France
[3]Academy of Romanian Scientists, 3 Ilfov, 050044, Bucharest, Romania

Presentation of some constructive solutions for a rotating machine with profiled rotors

Gabriel Fischer-Szava[1], Alexandru Dobrovicescu[1], Georgiana Dăescu (Duiculete)[1], Nicolae Băran[1], Mihaela Constantin[1] , Cătălina Dobre[1,2], Rana Adil Abdul-Nabe[1], Sevastiana Areta Ghioca[1]

[1]University Politehnica of Bucharest, Faculty of Mechanical Engineering and Mechatronics, Bucharest, Romania
[2]Academy of Romanian Scientists, Ilfov 3, 050044, Bucharest, Romania

Obiective specifice ale proiectului:

OS 5. Valorificarea rezultatelor cercetării întreprinse prin publicarea acestora în 2 reviste de renume, indexate WOS şi creşterea vizibilităţii lor prin participarea la cel puțin 2 conferinţe internaționale.

Certificate of attendance

This document was issued to confirm that

Cătălina Georgiana DOBRE

has attended and presented a paper at the

XXIII[rd] National Conference on Thermodynamics with International Participation

held at

"Dunărea de Jos" University of Galați

Faculty of Engineering

Galați, May 11-13, 2023

On behalf of the

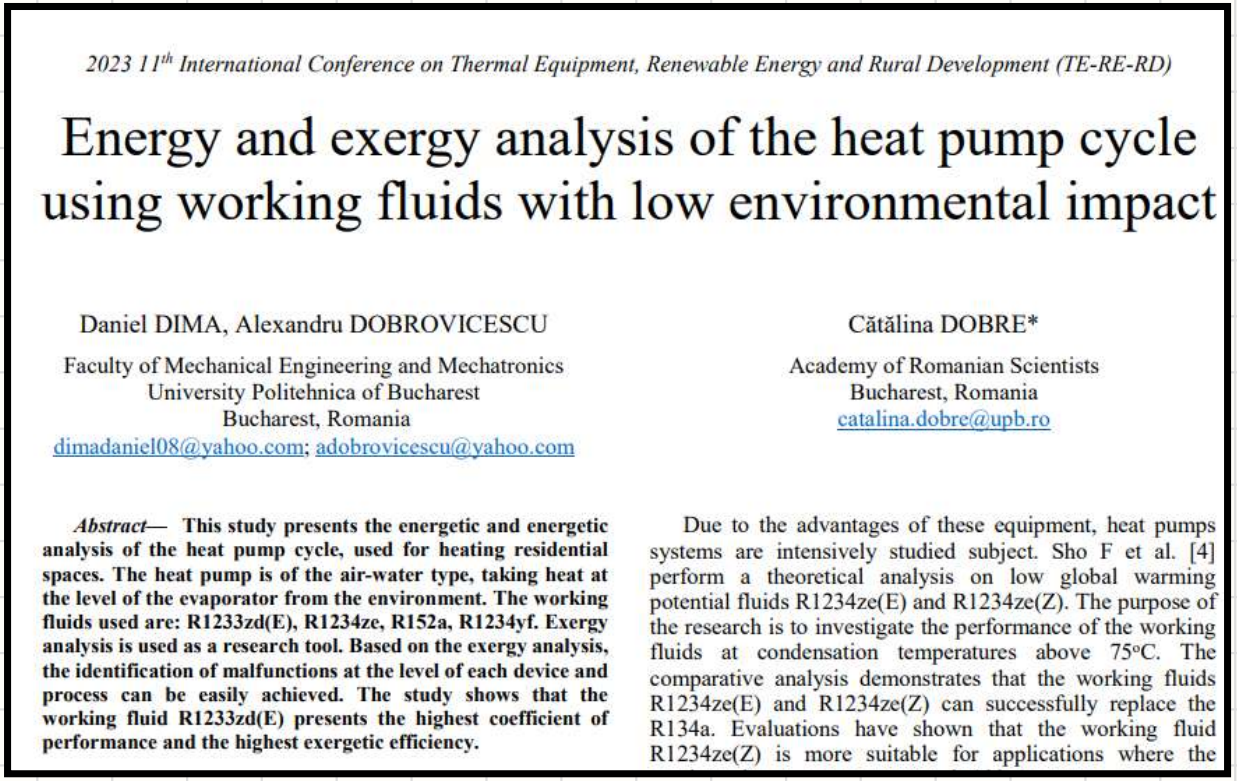
Refrigeration and Cryogenics Association of Romania (AFCR)

Prof. Liviu DRUGHEAN - President

Diseminarea rezultatelor (conferinte) - *etapa1*

Obiective specifice ale proiectului:

OS 5. Valorificarea rezultatelor cercetării întreprinse prin publicarea acestora în 2 reviste de renume, indexate WOS şi creşterea vizibilităţii lor prin participarea la cel puțin 2 conferinţe internaționale.



2023 11th International Conference on Thermal Equipment, Renewable Energy and Rural Development (TE-RE-RD)

Energy and exergy analysis of the heat pump cycle using working fluids with low environmental impact

Daniel DIMA, Alexandru DOBROVICESCU

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University Politehnica of Bucharest
Bucharest, Romania
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Cătălina DOBRE*

Academy of Romanian Scientists
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***Abstract*— This study presents the energetic and energetic analysis of the heat pump cycle, used for heating residential spaces. The heat pump is of the air-water type, taking heat at the level of the evaporator from the environment. The working fluids used are: R1233zd(E), R1234ze, R152a, R1234yf. Exergy analysis is used as a research tool. Based on the exergy analysis, the identification of malfunctions at the level of each device and process can be easily achieved. The study shows that the working fluid R1233zd(E) presents the highest coefficient of performance and the highest exergetic efficiency.**

Due to the advantages of these equipment, heat pumps systems are intensively studied subject. Sho F et al. [4] perform a theoretical analysis on low global warming potential fluids R1234ze(E) and R1234ze(Z). The purpose of the research is to investigate the performance of the working fluids at condensation temperatures above 75°C. The comparative analysis demonstrates that the working fluids R1234ze(E) and R1234ze(Z) can successfully replace the R134a. Evaluations have shown that the working fluid R1234ze(Z) is more suitable for applications where the

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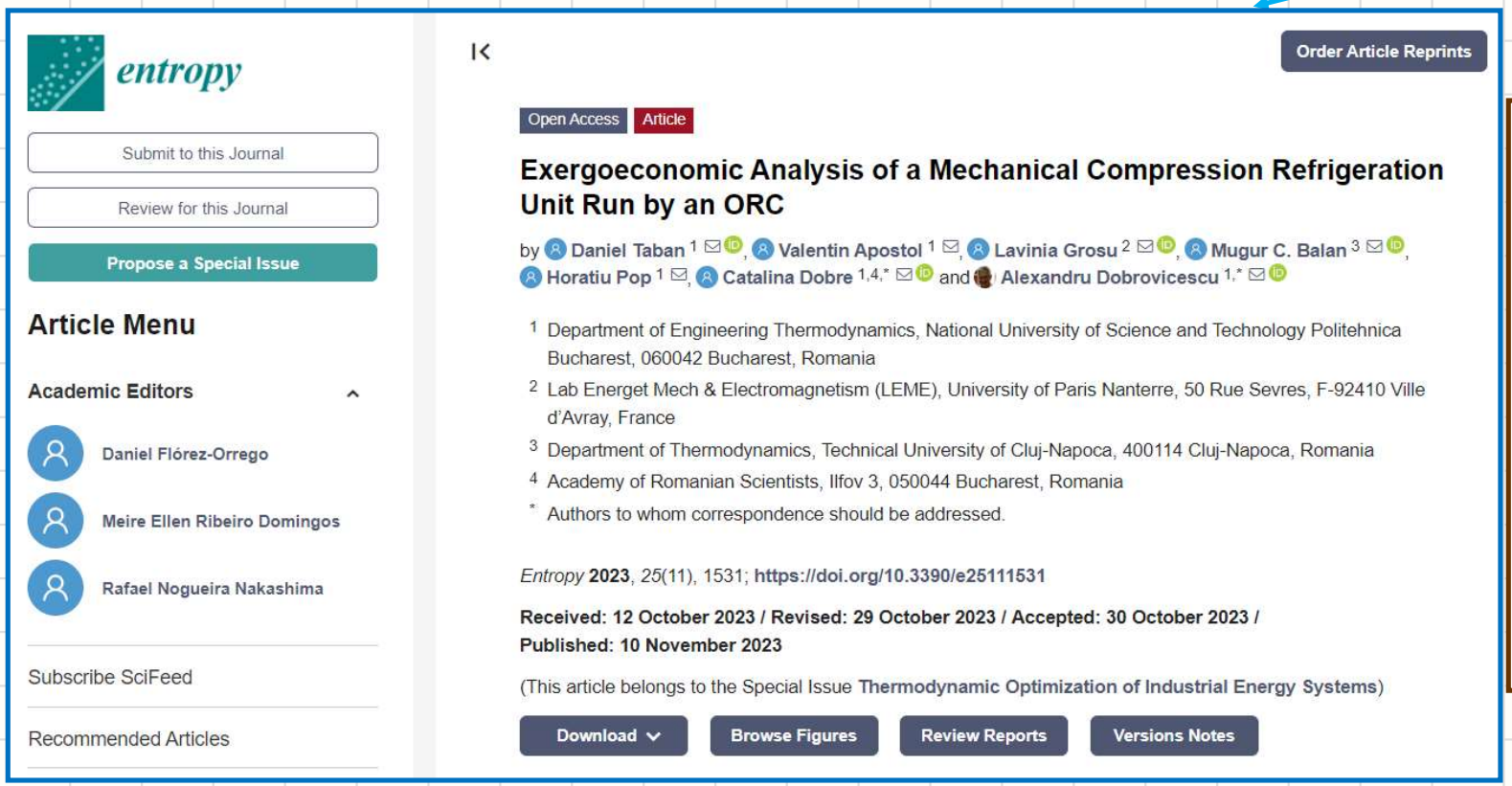
Disiminarea rezultatelor (Articole indexate WOS) –etapa 2

Obiective specific ale proiectului:

OS 5. Valorificarea rezultatelor cercetării întreprinse prin publicarea acestora în 2 reviste de renume, indexate WOS și creşterea vizibilităţii lor prin participarea la cel puțin 2 conferinţe internaționale.



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Exergoeconomic Analysis of a Mechanical Compression Refrigeration Unit Run by an ORC

by Daniel Taban [1], Valentin Apostol [1], Lavinia Grosu [2], Mugur C. Balan [3], Horatiu Pop [1], Catalina Dobre [1,4,*] and Alexandru Dobrovicescu [1,*]

[1] Department of Engineering Thermodynamics, National University of Science and Technology Politehnica Bucharest, 060042 Bucharest, Romania

[2] Lab Energet Mech & Electromagnetism (LEME), University of Paris Nanterre, 50 Rue Sevres, F-92410 Ville d'Avray, France

[3] Department of Thermodynamics, Technical University of Cluj-Napoca, 400114 Cluj-Napoca, Romania

[4] Academy of Romanian Scientists, Ilfov 3, 050044 Bucharest, Romania

[*] Authors to whom correspondence should be addressed.

Entropy **2023**, *25*(11), 1531; **https://doi.org/10.3390/e25111531**

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(This article belongs to the Special Issue **Thermodynamic Optimization of Industrial Energy Systems**)

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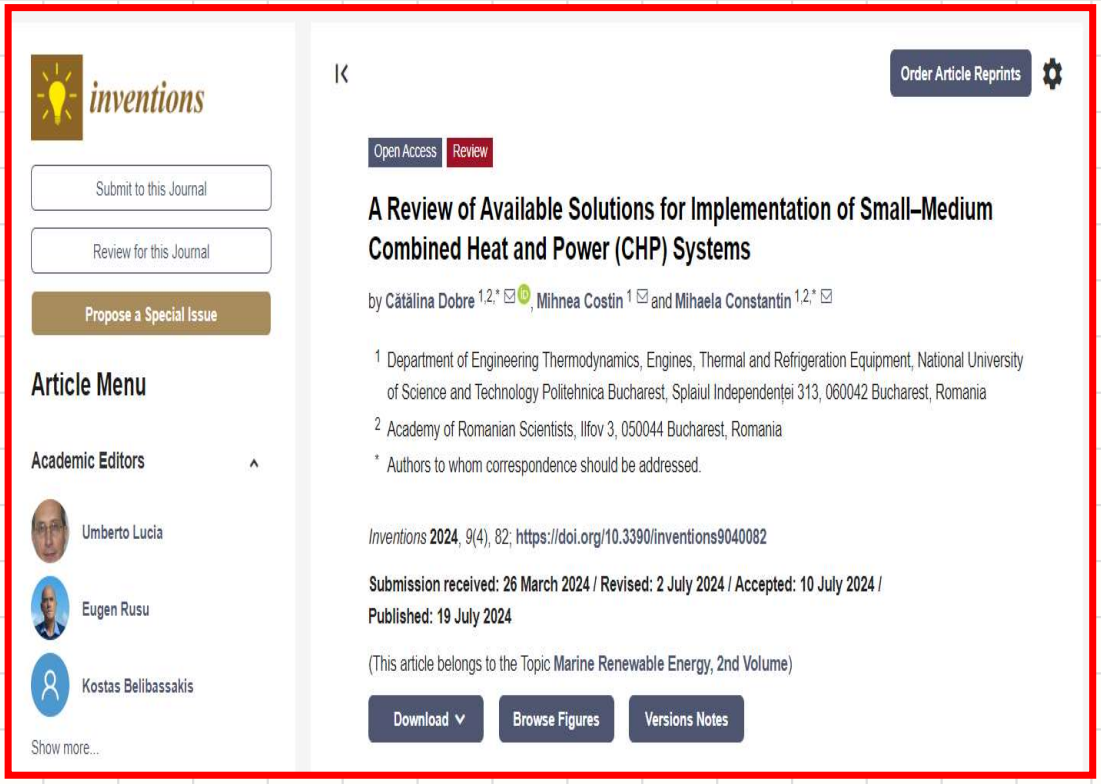
Diseminarea rezultatelor (Articole indexate WOS) –etapa 3

Obiective specifice ale proiectului:

OS 5. Valorificarea rezultatelor cercetării întreprinse prin publicarea acestora în 2 reviste de renume, indexate WOS şi creşterea vizibilităţii lor prin participarea la cel puțin 2 conferinţe internaționale.

I. Articole publicate – in cadrul etapei 3



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A Review of Available Solutions for Implementation of Small–Medium Combined Heat and Power (CHP) Systems

by Cătălina Dobre [1,2,*], Mihnea Costin [1] and Mihaela Constantin [1,2,*]

[1] Department of Engineering Thermodynamics, Engines, Thermal and Refrigeration Equipment, National University of Science and Technology Politehnica Bucharest, Splaiul Independenței 313, 060042 Bucharest, Romania

[2] Academy of Romanian Scientists, Ilfov 3, 050044 Bucharest, Romania

* Authors to whom correspondence should be addressed.

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Submission received: 26 March 2024 / Revised: 2 July 2024 / Accepted: 10 July 2024 / Published: 19 July 2024

(This article belongs to the Topic **Marine Renewable Energy, 2nd Volume**)

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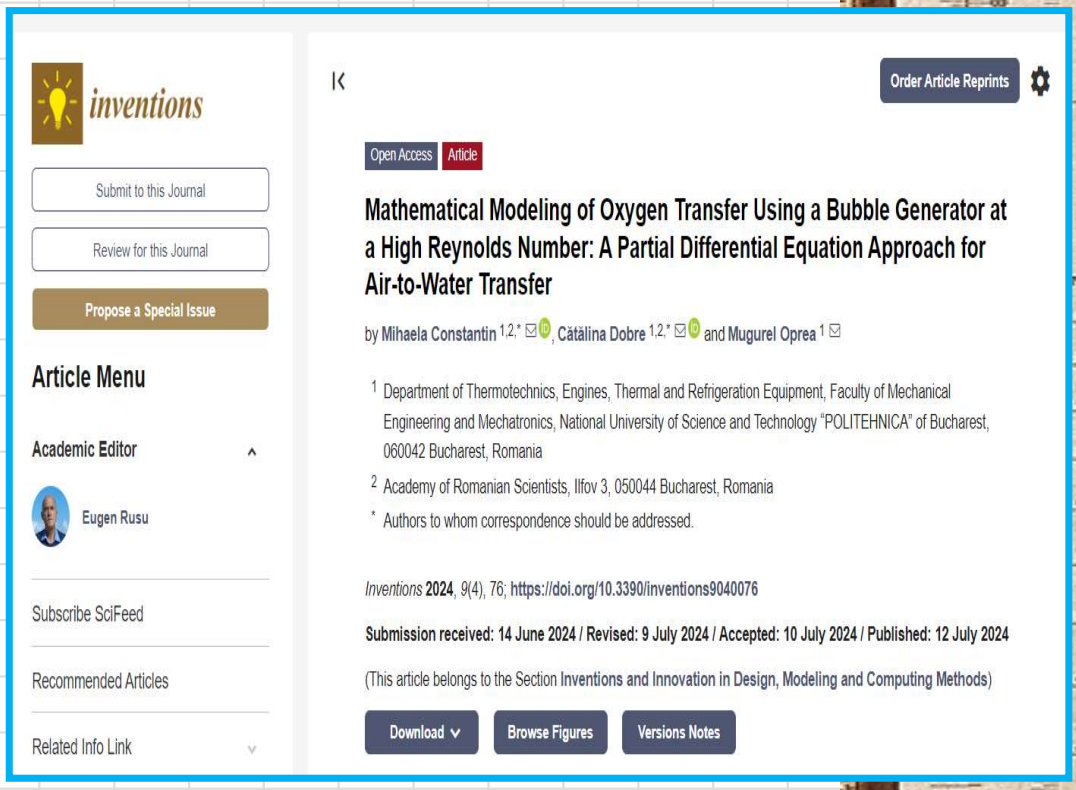

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Mathematical Modeling of Oxygen Transfer Using a Bubble Generator at a High Reynolds Number: A Partial Differential Equation Approach for Air-to-Water Transfer

by Mihaela Constantin [1,2,*], Cătălina Dobre [1,2,*] and Mugurel Oprea [1]

[1] Department of Thermotechnics, Engines, Thermal and Refrigeration Equipment, Faculty of Mechanical Engineering and Mechatronics, National University of Science and Technology "POLITEHNICA" of Bucharest, 060042 Bucharest, Romania

[2] Academy of Romanian Scientists, Ilfov 3, 050044 Bucharest, Romania

* Authors to whom correspondence should be addressed.

Inventions **2024**, *9*(4), 76; **https://doi.org/10.3390/inventions9040076**

Submission received: 14 June 2024 / Revised: 9 July 2024 / Accepted: 10 July 2024 / Published: 12 July 2024

(This article belongs to the Section **Inventions and Innovation in Design, Modeling and Computing Methods**)

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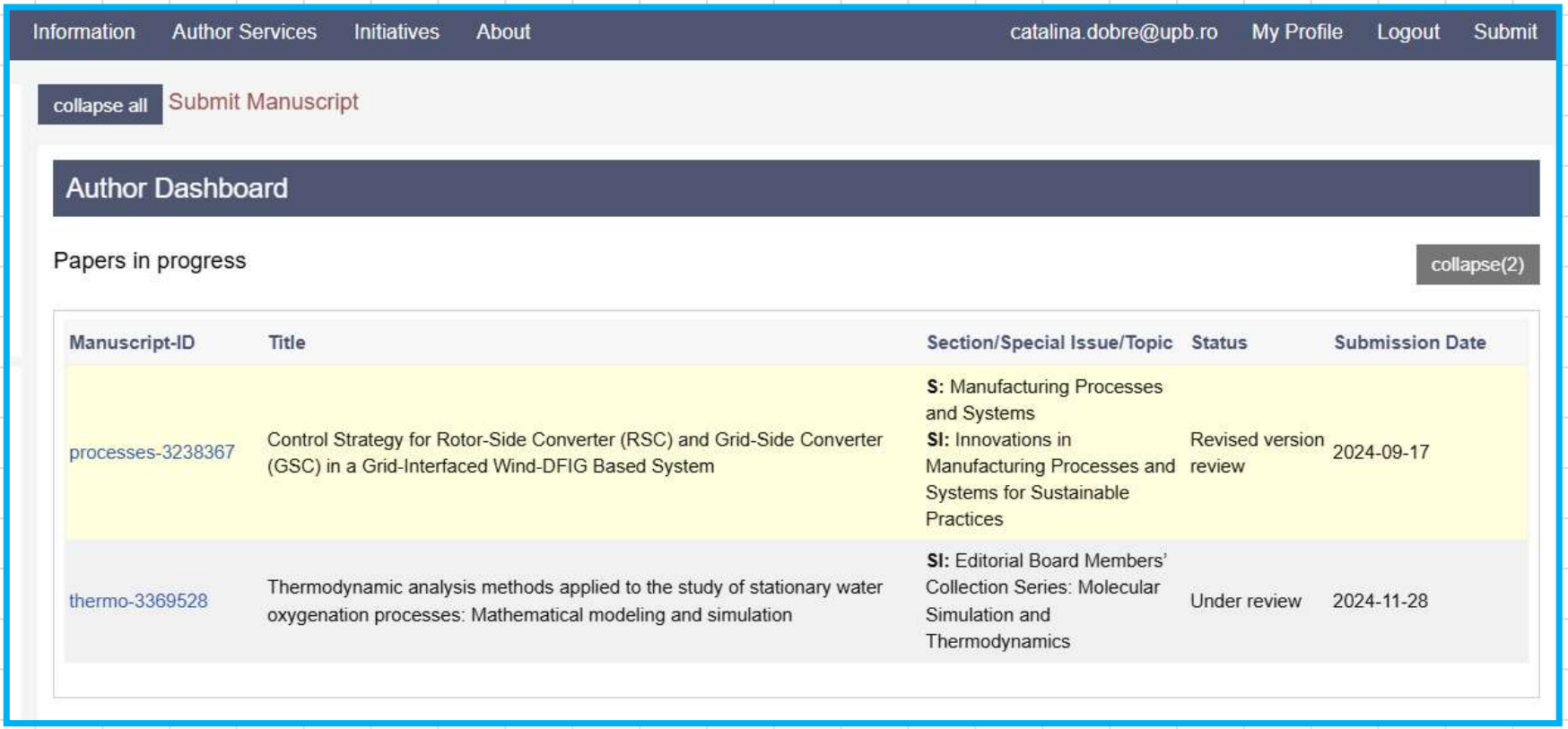
Diseminarea rezultatelor (Articole indexate WOS) –etapa 4

Obiective specifice ale proiectului:

OS 5. Valorificarea rezultatelor cercetării întreprinse prin publicarea acestora în 2 reviste de renume, indexate WOS şi creşterea vizibilităţii lor prin participarea la cel puțin 2 conferinţe internaționale.

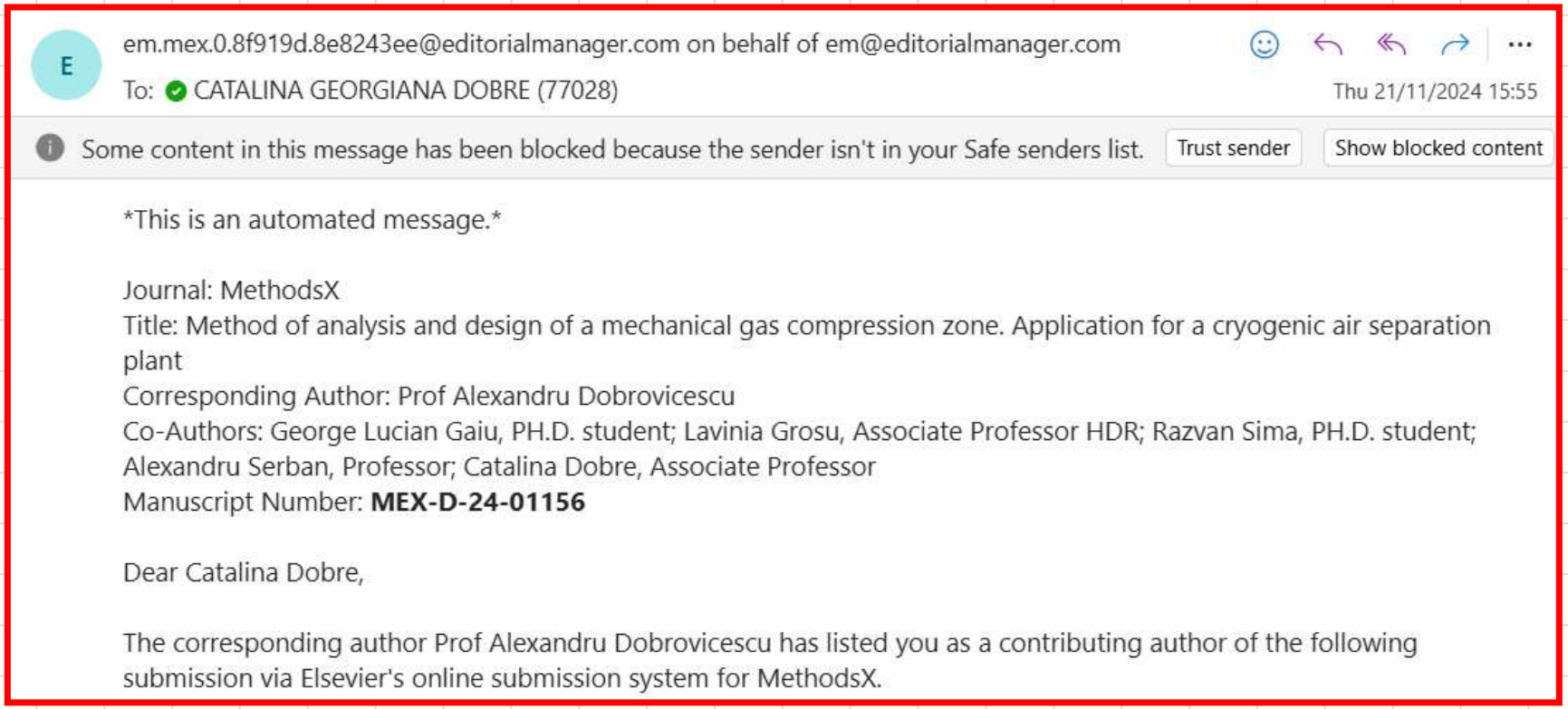
I. Articole in publicare – in cadrul etapei 4



Obiective specifice:

OS 5. Valorificarea rezultatelor cercetării întreprinse prin publicarea acestora în 2 reviste de renume, indexate WOS şi creşterea vizibilităţii lor prin participarea la cel puțin 2 conferinţe internaționale.

II. Articole in publicare



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Corresponding Author: Prof Alexandru Dobrovicescu
Co-Authors: George Lucian Gaiu, PH.D. student; Lavinia Grosu, Associate Professor HDR; Razvan Sima, PH.D. student; Alexandru Serban, Professor; Catalina Dobre, Associate Professor
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