

**Research Plan/ Energy and Renewable Energies Technology Center (2023/2024)**

| Completion of months 12-10 | Completion of months 6-4 | Completion of months 1-3  | The beneficiary                                          | kind of search |             | Affiliation                                     | Researcher                                                                                                                                   | Research Title                                                                                                                    | No. |
|----------------------------|--------------------------|---------------------------|----------------------------------------------------------|----------------|-------------|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----|
|                            |                          |                           |                                                          | Applied        | Theoretical |                                                 |                                                                                                                                              |                                                                                                                                   |     |
|                            |                          | <a href="#">Published</a> | The Ministry of Electricity<br>+Ministry the environment |                | -           | Energy and Renewable Energies Technology Center | <a href="#">Miqdam T Chaichan</a><br>Hissein A Kazem<br>Ali H A Al-Waeli<br>Wissam H Alawee<br><a href="#">Mohammed A Fayad</a><br>K. Sopian | Recent advances in solar distillation: A review                                                                                   | 1   |
|                            |                          | <a href="#">Published</a> | The Ministry of Electricity<br>+Ministry the environment |                | -           | Energy and Renewable Energies Technology Center | Hussein A Kazem<br><a href="#">Miqdam T Chaichan</a><br>Ali A H Al-Waeli<br>K. Sopian                                                        | Solar photovoltaic systems applications for electrical vehicle: A review                                                          | 2   |
|                            |                          | <a href="#">Published</a> | Oil Ministry                                             | -              |             | Energy and Renewable Energies Technology Center | <a href="#">Miqdam T Chaichan</a><br>Noor Salih Ekab<br>Isam E Yousif                                                                        | Experimental evaluation of the combustion and emission characteristics of waste non-edible restaurant oils and high sulfur diesel | 3   |
|                            | 70%                      | %50                       | Ministry of housing                                      | -              |             | Energy and Renewable Energies Technology Center | <a href="#">د. سناء عبد الهادي حافظ</a><br>شيماء عبد حسين<br>رشا عبد حسين                                                                    | Preparation (pc/pp/HDPE) blends with different reinforcing                                                                        | 4   |

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|                            |                          |                          |                                           | Applied        | Theoretical |                                                 |                                                                                                                        |                                                                                                                                                              |     |
|                            |                          |                          |                                           |                |             |                                                 |                                                                                                                        | materials using in work fields                                                                                                                               |     |
|                            | 70%                      | %50                      | Ministry of housing                       | -              |             | Energy and Renewable Energies Technology Center | <a href="#">Sanaa A.hafad</a><br>Abdulkalk F.Hamood<br><b><u>Raghad R.Mahdi</u></b><br>شيماء عبد حسين<br>بشار رضا      | Modified rubber mixture blends by adding carbon powder as filler materials                                                                                   | 5   |
|                            | 70%                      | %50                      | Ministry of Environment + Ministry of Oil | -              |             | Energy and Renewable Energies Technology Center | <a href="#">.Sanaa A.hafad</a><br><b><u>Mohammed A.Fayad</u></b><br><b><u>Raghad R.Mahdi</u></b><br>Abdulkalk F.Hamood | Prepared new type of polymer blends (laminates) when manufacturing as thin sheets                                                                            | 6   |
|                            | 100% Done                | %85                      | Ministry of Environment + Ministry of Oil | -              |             | Energy and Renewable Energies Technology Center | <a href="#">Mohammed A.Fayad</a><br><a href="#">Miqdam T.Chaichan</a><br>Marwa K. Abood                                | The impact of incorporating EGR rates and coconut biodiesel on morphological characteristics of particulate matter in a compression ignition diesel engine . | 7   |

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|                            |                          |                                |                                                          | Applied        | Theoretical |                                                 |                                                                                                                                                                          |                                                                                                                                                                    |     |
|                            |                          | <a href="#">Publishe<br/>d</a> | Ministr<br>y of Enviro<br>nment<br>+ Ministr<br>y of Oil | -              |             | Energy and Renewable Energies Technology Center | <a href="#">MohammedA. Fayad</a><br>Alaa Dhari Jawad Al Bayati<br>Hasanain A. Abdul Wahhab<br>Abbas J. Sultan<br>Laith S. Sabri<br>Hayder A. Dhahad                      | Effect of FIPs strategy and nanoparticles additives into the renewable fuel blends on NOX emissions ,PM size distribution and soot oxidation in CRDI diesel engine | 8   |
|                            | %100<br>Send             | %85                            | الكهرباء                                                 | -              |             | Energy and Renewable Energies Technology Center | Nassr F. Hussein<br>Ali A. Ismaeel<br><a href="#">Mohammed A.Fayad</a><br><a href="#">Miqdam T.Chaichan</a>                                                              | Photovoltaic panels' thermal and electrical performance in the presence of soot nanoparticles and dust: An experimental study                                      | 9   |
|                            | %100<br>Send             | %75                            | Ministr<br>y of Enviro<br>nment<br>+ Ministr<br>y of Oil | -              |             | Energy and Renewable Energies Technology Center | <a href="#">Mohammed A.Fayad</a><br>Amerah A. Radhi<br>Marwa K. Abood<br>Hind A.Al salihi<br><br><a href="#">Sanaa A. Hafad</a><br><br><a href="#">Miqdam T.Chaichan</a> | Effect of injection strategies and environment-friendly fuel on soot nanoparticles, exhaust emissions and environment sides                                        | 10  |

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|                               |                             |                             |                             | Applied        | Theoretical |                                                 |                                                                                                                                                                                    |                                                                                                            |     |
|                               | Published                   | %90                         | The Ministry of Electricity |                | -           | Energy and Renewable Energies Technology Center | <b><u>Salam Waley Shneen</u></b><br>Hashmia Sh. Dakheel<br>Zainab Basheer Abdullah                                                                                                 | Simulation and modeling for controlling stepper motor with tuned PID by GWO: comparative study             | 11  |
|                               |                             | Published                   | The Ministry of Electricity |                | -           | Energy and Renewable Energies Technology Center | Fatin Nabeel Abdulla<br>Ghada Adel Aziz<br><b><u>Salam Waley Shneen</u></b>                                                                                                        | GWO-PID of Two-phase Hybrid Stepping Motor for Robotic Grinding Force                                      | 12  |
|                               |                             | <b><u>Published</u></b>     | The Ministry of Electricity |                | -           | Energy and Renewable Energies Technology Center | Mohammed Qasim Sulttan<br><b><u>Salam Waley Shneen</u></b><br><br>Jafaar Mohammed Daif Alkhasraji                                                                                  | Performance enhancement of large-scale linear dynamic MIMO systems using GWO-PID controller                | 13  |
|                               | Published                   | %80                         | The Ministry of Industry    | -              |             | Energy and Renewable Energies Technology Center | <b><u>Dr. Louay Abd Al-Azez Mahdi</u></b><br><b>Samir Akram Mahmood</b><br><b><u>Muna K.J. Alnaamee</u></b><br><b><u>Miqdam T. Chaichan</u></b><br><b>Hasanain A. Abdul Wahhab</b> | Thermal analysis for condensation in wire on tube condenser by using the exergy and penalty factor methods | 14  |

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|                               |                             |                             |                                                              | Applied        | Theoretical |                                                 |                                                                                                                                                                                                 |                                                                                                                                    |     |
|                               | Publish ed                  | %80                         | The Ministr y of Industr y+ The Ministr y of Enviro nment    | -              |             | Energy and Renewable Energies Technology Center | <u><b>Dr. Louay A.Mahdi</b></u><br><u><b>Miqdam T. Chaichan</b></u><br><b>Khaleel I.Abass</b><br><u><b>Mohammed A. Fayad</b></u><br><br><b>Hasanain A.Abdul Wahhab</b><br><b>Hussein A.Kaze</b> | Characterization of the Thermophysical properties of Paraffine-Based Nanocomposite containing Alumina and Iron Oxide Nanoparticles | 15  |
|                               | %100 Send                   | %70                         | The Ministr y of Industr y                                   | -              |             | Energy and Renewable Energies Technology Center | <u><b>Dr. Louay Abd Al-Azez Mahdi</b></u><br><b>Miqdam Tariq Chaicha</b>                                                                                                                        | The analysis of the entropy generation for vertical heated surface by natural convection and radiation                             | 16  |
|                               |                             | <u><b>Publishe d</b></u>    | The Ministr y of Enviro nment +The Ministr y of Electric ity | -              |             | Energy and Renewable Energies Technology Center | <b>Wissam H Alawee,</b><br><b>Suha A Mohammed,</b><br><b>AS Abdullah,</b><br><b>Ali Basem,</b><br><b>Alaa Dhari</b><br><b>Jawad Al-Bayati,</b><br><b>ZM Omara,</b><br><b>Fadl A Essa</b>        | Utilizing the dangled jute cords, reflectors, and condensation cycle to improve the double sloped distiller performance            | 17  |

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|                               |                             |                             |                                                          | Applied        | Theoretical |                                                 |                                                                                                                                                         |                                                                                                                                                                 |     |
|                               | Published                   | %75                         | The Ministry of Environment +The Ministry of Electricity | -              |             | Energy and Renewable Energies Technology Center | <b><u>Suha A. Mohammed</u></b><br>Wissam H. Alawee<br>A.S. Abdullah<br>Ali Basem<br>Alaa Dhari Jawad Al-Bayati<br>Z.M. Omara<br>Fadl A. Essa            | Advancing Solar Distillation Efficiency through Calcium Hydroxide Coating and Enhanced Configuration of Mirror-Assisted System                                  | 18  |
|                               |                             | <b><u>Published</u></b>     | The Ministry of Environment +The Ministry of Electricity | -              |             | Energy and Renewable Energies Technology Center | <b><u>Suha A. Mohammed</u></b><br><b>LA Al-Haddad,</b><br><b>WH Alawee,</b><br><b>HA Dhahad,</b><br><b>AA Jaber, ..</b>                                 | Forecasting the productivity of a solar distiller enhanced with an inclined absorber plate using stochastic gradient descent in artificial neural networks      | 19  |
|                               |                             | <b><u>Published</u></b>     | The Ministry of Environment +The Ministry of             | -              |             | Energy and Renewable Energies Technology Center | <b>Fadl A Essa,</b><br><b>Wissam H Alawee,</b><br><b>AS Abdullah,</b><br><br><b><u>Suha A Mohammed,</u></b><br><br><b>Ali Majdi,</b><br><b>ZM Omara</b> | Achieving better thermos-enviroeconomic performances of modified cords pyramid distiller with various arrangements of baffles, reflectors, and vapor extraction | 20  |

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|                               |                             |                             |                                                  | Applied        | Theoretical |                                                 |                                                                                                                                                            |                                                                                                                                                                          |     |
|                               |                             |                             | Electricity                                      |                |             |                                                 |                                                                                                                                                            |                                                                                                                                                                          |     |
|                               | Published                   | %90                         | The Ministry of Environment + Ministry of Health |                | -           | Energy and Renewable Energies Technology Center | <b>M.A.I Alhamid</b><br><a href="#">shaimaa b. Albaghdadi</a><br><b>T.S Gaaz</b><br><b>A.AKhadom</b><br><b>E.Yousif</b><br><b><u>Dr .ahmed alamery</u></b> | <b>Green chemistry solutions:</b><br><b>Harnessing</b><br><b>pharmaceuticals as</b><br><b>environmentally friendly</b><br><b>corrosion inhibitors:</b><br><b>Areview</b> | 21  |
|                               | %90                         | %30                         | Ministry of Environment + Ministry of Oil        | -              |             | Energy and Renewable Energies Technology Center | Taghred salman<br><a href="#">shaimaa b. Albaghdadi</a><br>Bassma hessen                                                                                   | Magnetic photo-chemically synthesized co3o4 nanoparticales for adsorption of pentachlorophenol pesticide from water                                                      | 22  |
|                               | %95                         | 90%                         | The Ministry of Environment + Ministry of Health |                | -           | Energy and Renewable Energies Technology Center | <a href="#">shamiaa b. Albaghdadi</a><br><b><u>Dr .ahmed alamery</u></b>                                                                                   | Advancements in corrosion inhibition Thiadiazole derivatives as promising Agents                                                                                         | 23  |

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|                               |                             |                             |                                    | Applied        | Theoretical |                                                 |                                                                                                                                                                 |                                                                                                     |     |
|                               | Publish ed                  | %70                         | The Ministr y of Industr y         |                | -           | Energy and Renewable Energies Technology Center | <u>Salman Hussien Omran</u><br><u>Salam Waley Shneen</u><br><u>Mohanned M.H.Alkhafaji</u>                                                                       | Beta Defective Estimators with Truncated Sampling Plan in Quality Control in Car Batteries Industry | 24  |
|                               | %100 Done                   | %70                         | The Ministr y of Industr y         |                | -           | Energy and Renewable Energies Technology Center | <u>Salman Hussien Omran</u><br><u>Salam Waley Shneen</u><br><u>Batool Ibrahim Jameel</u><br><u>Omar Hashim Hassoon</u><br><u>FATIMAH RIDHA</u><br><u>ABBOOD</u> | Fuzzy logic test in drawing and calculating defective ratio control charts in Industry Company      | 25  |
|                               | 100% Done                   | %70                         | The Ministr y of Industr y         |                | -           | Energy and Renewable Energies Technology Center | <u>Salman Hussien Omran</u><br><u>Salam Waley Shneena</u><br>Batool Ibrahim Jameel<br>Omar Hashim Hassoon<br><u>Mohammed A. Fayad</u>                           | Fuzzy Logic Technique Based on Classification Function Application in Quality Control               | 26  |
|                               | %100 Send                   | %70                         | The Ministr y of Enviro nment +The | -              |             | Energy and Renewable Energies Technology Center | Ali H. Attallah<br>Marwa K. Abood<br><u>Ahmed Al-Amiery</u>                                                                                                     | Influence of Laser Energy on the Properties of Gallium Oxide                                        | 27  |

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|                            |                          |                          |                                                          | Applied        | Theoretical |                                                 |                                                                                                                                                                                       |                                                                                                                            |     |
|                            |                          |                          | Ministry of Electricity                                  |                |             |                                                 |                                                                                                                                                                                       | Nanoparticles for Solar Panel Surface Coating                                                                              |     |
|                            | Published                | %70                      | The Ministry of Environment +The Ministry of Electricity | -              |             | Energy and Renewable Energies Technology Center | <b><u>Raghad Rahman Mahdi</u></b><br>Sameer Atta Maki<br><b><u>Hind A.Mahdi</u></b><br>Marwa K. Abood<br><b><u>Raghad.j.halbos</u></b><br><b><u>.Rugia abed al-Hussien hassan</u></b> | Enhancement of the properties of solar cells fabricated by cadmium oxide deposited on porous silicon                       | 28  |
|                            | Published                | %70                      | The Ministry of Environment +The Ministry of Electricity | -              |             | Energy and Renewable Energies Technology Center | <b><u>Raghad Rahman Mahdi</u></b><br>Sameer Atta Maki<br><b><u>Hind A.Mahdi</u></b><br>Marwa K. Abood<br><b><u>Raghad.j.halbos</u></b><br><b><u>Rugia abed al-Hussien hassan</u></b>  | Study some properties of solar cell fabricated by deposited cadmium oxide on porous silicon in three different temperature | 29  |
|                            | %70                      | %50                      | The Ministry of Environment                              | -              |             | Energy and Renewable Energies                   | <b><u>Raghad Rahman Mahdi</u></b><br>Marwa K. Abood                                                                                                                                   | Fabricated and study some physical properties of two electronic devices using the pulsed laser method                      | 30  |

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|                            |                          |                          |                                                    | Applied        | Theoretical |                                                 |                                                                                                                                                                                                                            |                                                                                                                                                |     |
|                            |                          |                          | nment +The Ministr y of Electric ity               |                |             | Technology Center                               |                                                                                                                                                                                                                            |                                                                                                                                                |     |
|                            | 100% Done                | %70                      | Ministr y of housin g                              | -              |             | Energy and Renewable Energies Technology Center | <u><b>Raghad.J.Halbos</b></u><br>Sariya AL-Algwi<br>Rashed T. Rasheed<br><u><b>Ruqia abed al-Hussien hassan</b></u><br><u><b>Raghad Rahman Mahdi</b></u><br><u><b>Hasanain Azeez</b></u><br><u><b>Mohammed A Fayad</b></u> | preparation and characterization of In <sub>2</sub> O <sub>3</sub> Nano particles to use as gas sensor                                         | 31  |
|                            |                          | Published                | The Ministr y of Enviro nment +Minis try of Health | -              |             | Energy and Renewable Energies Technology Center | <u><b>Mustafa A.I. Al-Hami</b></u><br><u><b>Dr.Ahmed Alamiery</b></u>                                                                                                                                                      | Unlocking the power of 4-Acetamidoantipyrine:Apro mising Corrosion Inhibitor for Preserving Mild Steel in Harsh Hydrochloric Acid Environments | 32  |
|                            |                          | Published                | The Ministr y of Enviro                            | -              |             | Energy and Renewable Energies                   | <u><b>Mustafa A.I. Al-Hamid</b></u><br><u><b>Dr.Ahmed Alamier</b></u>                                                                                                                                                      | Understanding the Mechanisms of Furan-Based Corrosion Inhibition for Mild Steel in                                                             | 33  |

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|                               |                             |                             |                                                                                         | Applied        | Theoretical |                                                             |                                                                                                                               |                                                                                                                                                                                                    |     |
|                               |                             |                             | nment<br>+Minis<br>try of<br>Health                                                     |                |             | Technology<br>Center                                        |                                                                                                                               | HCl :An Experimental and<br>Theoretical Perspective.                                                                                                                                               |     |
|                               |                             | Published                   | The<br>Ministr<br>y of<br>Enviro<br>nment<br>+The<br>Ministr<br>y of<br>Electric<br>ity | -              |             | Energy and<br>Renewable<br>Energies<br>Technology<br>Center | <b><u>Mustafa A.I. Al-Hamid</u></b><br><b><u>Dr.Ahmed Alamier</u></b>                                                         | Evaluating the Corrosion<br>Inhibition Efficiency of 5-<br>(4-pyridyl)3-Mercapto-<br>1,2,4-Triazole for Mild<br>Steel in HCl: Insights from<br>Weight Loss<br>Measurements and DFT<br>Calculations | 34  |
|                               | %100<br>Send                | %80                         | The<br>Ministr<br>y of<br>Enviro<br>nment<br>+The<br>Ministr<br>y of<br>Electric<br>ity | -              |             | Energy and<br>Renewable<br>Energies<br>Technology<br>Center | حيدر عبد ضهد<br>توماس مكريتس<br><b><u>أ.م.د محمد علي فياض</u></b><br><b><u>أ.م.م. طارق جيجيان</u></b><br>د . حسنين عبد الوهاب | Particulate Matters<br>Size Distribution In<br>Nucleation And<br>Accumulation Modes<br>For Compression<br>Ignition Engine Run<br>By Ultra-Low Sulfur<br>Diesel And Rapeseed<br>Methyl Ester        | 35  |

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|                               |                             |                             |                                                          | Applied        | Theoretical |                                                 |                                                                                                                                                                                                                                                                       |                                                                                                 |     |
|                               |                             |                             |                                                          |                |             |                                                 |                                                                                                                                                                                                                                                                       |                                                                                                 |     |
|                               |                             | <a href="#">Published</a>   | The Ministry of Environment+ The Ministry of Electricity |                | -           | Energy and Renewable Energies Technology Center | Gazy F Al-Sumaily,<br><b><u>Salman Hussien Omran,</u></b><br>Amerah A Radhi,<br>Hussain Ali Hussain,<br>Azher M Abed,<br><b><u>Mohammed A Fayad,</u></b><br><b><u>Miqdam Tariq Chaichan,</u></b><br>Hasanain A Abdul<br><b><u>Wahhab, Louay Abd Al-Azez Mahdi</u></b> | Enhancing heat transfer unraveling the dynamics of mixed convection in a vertical porous cavity | 36  |
|                               |                             | <a href="#">Published</a>   | The Ministry of Industry                                 |                | -           | Energy and Renewable Energies Technology Center | أ.م.د. لؤى عبدالعزيز مهدي<br>منى خضير النعيمي<br>احمد قصي سلام<br><b><u>أ.م. سلمان حسين عمران</u></b><br><b><u>م.م. هند عامر مهدي</u></b><br>م.د. مروة قاسم عيود<br>حسنين عدنان عبدالوهاب                                                                             | Theoretical Entropy Generation Of Forced Convection Flow Around A Horizontal Cylinder           | 37  |

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|                               |                             |                             |                                                                                   | Applied        | Theoretical |                                                             |                                                                                                                                                                                                         |                                                                                                           |     |
|                               | %100<br>Send                | %80                         | Ministr<br>y of<br>Enviro<br>nment<br>+<br>Ministr<br>y of Oil                    | -              |             | Energy and<br>Renewable<br>Energies<br>Technology<br>Center | <u>أ.م.د. طارق جيجان</u><br><u>م.م. هند عامر مهدي</u><br><u>أ.م.د. محمد علي فياض</u><br><u>أ.م. سلمان حسين عمران</u><br>م.م. احمد قصي سالم<br>م.د. مروة قاسم عبود<br><u>أ.م.د. سناء عبد الهادي حافظ</u> | <b>Optimizing performance<br/>and reducing emission<br/>with Diesel-Water<br/>emulsion fuel</b>           | 38  |
|                               | %100<br>Send                | %70                         | The Ministr<br>y of<br>Electric<br>ity<br>+The Ministr<br>y of<br>Enviro<br>nment | -              |             | Energy and<br>Renewable<br>Energies<br>Technology<br>Center | مقدم طارق جيجان<br><u>أ.م.د. سناء عبد الهادي حافظ</u><br>احمد قصي<br><u>أ.م.د. محمد علي فياض</u><br>سلافة ابراهيم<br><u>أ.م.د. شيماء باسم البغدادي</u><br>حسنين عدنان عبدالوهاب                         | The impact of engine<br>performance<br>characteristics of engine<br>fueled with diesel water<br>emulation | 39  |

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| Completion of months 12-10 | Completion of months 6-4 | Completion of months 1-3 | The beneficiary                                          | kind of search |             | Affiliation                                     | Researcher                                                                                                                                            | Research Title                                                                                                                                                          | No. |
|----------------------------|--------------------------|--------------------------|----------------------------------------------------------|----------------|-------------|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
|                            |                          |                          |                                                          | Applied        | Theoretical |                                                 |                                                                                                                                                       |                                                                                                                                                                         |     |
|                            | %100 Send                | %75                      | Ministry of Environment + Ministry of Oil                | -              |             | Energy and Renewable Energies Technology Center | <u>أ.م.د محمد علي فياض</u><br><u>م.د مروة قاسم عبود</u><br><u>م.م هند عامر مهدي</u><br><u>أ.م.د حسنين عدنان عبد الوهاب</u><br><u>أ.م.د طارق جيجان</u> | Experimental Effects of The Alcohol-Diesel Blends And Exhaust Gas Recirculation (EGR) In Enhancement of NO <sub>x</sub> -Pm Trade-off In Direct Injection Diesel Engine | 40  |
|                            |                          | Published                | The Ministry of Electricity +The Ministry of Environment | -              |             | Energy and Renewable Energies Technology Center | <u>Louay A. Mahdi*</u><br>Hayder M. Ali<br>Muna K. AL-naame<br>Ali Oodaaabd<br>Waleed K. Alani<br><u>Salman H. Omran</u><br>Hasanain A. Abdul Wahhab  | The Chest Freezer Performance With Non-Condensable Gases                                                                                                                | 41  |
|                            |                          | Published                | The Ministry of Electricity +The Ministry of Environment | -              |             | Energy and Renewable Energies Technology Center | لطيف طالب عبيد<br>حسنين عدنان عبدالوهاب<br><u>أ.م.د طارق جيجان</u>                                                                                    | Influence of Burner Diameter on Premixed Flame Shape and Quenching                                                                                                      | 42  |

**Research Plan/ Energy and Renewable Energies Technology Center (2023/2024)**

| Completion of months<br>12-10 | Completion of months<br>6-4 | Completion of months<br>1-3 | The beneficiary                                                             | kind of search |             | Affiliation                                                 | Researcher                                                                                                                | Research Title                                                                                              | No. |
|-------------------------------|-----------------------------|-----------------------------|-----------------------------------------------------------------------------|----------------|-------------|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-----|
|                               |                             |                             |                                                                             | Applied        | Theoretical |                                                             |                                                                                                                           |                                                                                                             |     |
|                               |                             |                             | y of<br>Enviro<br>nment                                                     |                |             |                                                             | <a href="#">أ.م.د محمد علي فياض</a><br>أ.م.د غازي فيصل سلومي                                                              |                                                                                                             |     |
|                               | Publish<br>ed               | %50                         | The Ministr<br>y of Electric<br>ity<br>+The Ministr<br>y of Enviro<br>nment | -              |             | Energy and<br>Renewable<br>Energies<br>Technology<br>Center | محمد غازي عجيل<br>انجل جيداك<br>حسنين عدنان عبدالوهاب<br><u>أ.م.د لؤي عبدالعزيز مهدي</u><br><u>أ.م.د مقدم طارق جيجيان</u> | Experimental<br>Investigation Of PV/T<br>Solar Collector Efficiency<br>With Using A Spherical<br>Shape Fins | 43  |
|                               | Publish<br>ed               | %50                         | The Ministr<br>y of Electric<br>ity<br>+The Ministr<br>y of Enviro<br>nment | -              |             | Energy and<br>Renewable<br>Energies<br>Technology<br>Center | بسام شلال<br>انجل جيداك<br>حسنين عدنان عبدالوهاب<br><u>أ.م.د لؤي عبدالعزيز مهدي</u><br><u>أ.م.د مقدم طارق جيجيان</u>      | Enhancement PV/T Solar<br>Collector Efficiency With<br>Using Alumina<br>Nanoparticles Additive              | 44  |
|                               | Publish<br>ed               | %50                         | The Ministr<br>y of                                                         | -              |             | Energy and<br>Renewable<br>Energies                         | علي عودة عبد<br>تماضر الناصر                                                                                              | Evaluation of Climate<br>Parameters Impact on                                                               | 45  |

**Research Plan/ Energy and Renewable Energies Technology Center (2023/2024)**

| Completion of months<br>12-10 | Completion of months<br>6-4 | Completion of months<br>1-3 | The beneficiary                                    | kind of search |             | Affiliation                                     | Researcher                                                                             | Research Title                                                                                                         | No. |
|-------------------------------|-----------------------------|-----------------------------|----------------------------------------------------|----------------|-------------|-------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-----|
|                               |                             |                             |                                                    | Applied        | Theoretical |                                                 |                                                                                        |                                                                                                                        |     |
|                               |                             |                             | Electricity<br>+The Ministry of Environment        |                |             | Technology Center                               | نورا صالح عكاب<br>وسام هادي عليوي<br>حسين عدنان<br><u>أ.مقدم طارق جيجان</u>            | Grid-Connected PV Electricity Generation: An Experimental Approach                                                     |     |
|                               |                             | %60                         | Ministry of Health<br>+The Ministry of Environment | -              |             | Energy and Renewable Energies Technology Center | <u>أ.م.د سناء عبد الهادي حافظ</u><br><u>أ.د احمد عبدالأمير</u>                         | Synergistic Corrosion Inhibition of Mild Steel in HCL Solution Using Poly(vinyl alcohol) and Polyethylene Glycol Blend | 46  |
|                               |                             | %50                         | Ministry of Health<br>+The Ministry of Environment | -              |             | Energy and Renewable Energies Technology Center | <u>Sanaa A. Hafad</u><br><u>Ahmed A. Al-Amiery</u>                                     | Ynergistic Corrosion Inhibition of Mild Steel in HCL Solution Using Acacia Gum (Gum Arabic and Chitosan)               | 47  |
|                               |                             | <u>Published</u>            | Ministry of Environment<br>+                       |                | -           | Energy and Renewable Energies Technology Center | Lina M. Shaker<br><u>Ahmed A. Al-Amiery</u><br><br>Talib K. Abed<br>Walid K. Al-Azzawi | <i>An overview of the density functional theory on antioxidant bioactivity predictive feasibilities:</i>               | 48  |

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| Completion of months 12-10 | Completion of months 6-4 | Completion of months 1-3  | The beneficiary                                          | kind of search |             | Affiliation                                     | Researcher                                                                                         | Research Title                                                                                  | No. |
|----------------------------|--------------------------|---------------------------|----------------------------------------------------------|----------------|-------------|-------------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----|
|                            |                          |                           |                                                          | Applied        | Theoretical |                                                 |                                                                                                    |                                                                                                 |     |
|                            |                          |                           | Ministry of Oil                                          |                |             |                                                 | Abdul A.H. Kadhum<br>Ghassan M. Sulaiman<br>Hamdoon A. Mohammed ,<br>Mudassir Khan<br>Riaz A. Khan | <i>Insights from natural antioxidant products</i>                                               |     |
|                            |                          | <a href="#">Published</a> | Ministry of Environment + Ministry of Oil                | -              |             | Energy and Renewable Energies Technology Center | <u>Lina M. Shaker,</u><br><a href="#">Ahmed A. Al-Amiery</a><br><br><u>Waleed K. Al-Azzawi</u>     | <i>Nanomaterials: paving the way for the hydrogen energy frontier</i>                           | 49  |
|                            | %100 Send                | %50                       | The Ministry of Electricity +The Ministry of Environment |                | -           | Energy and Renewable Energies Technology Center | <a href="#">Ahmed A. Al-Amiery</a><br><br><a href="#">Mohammed A. Fayad</a>                        | Solar cells and thermal effects: A Comprehensive Review                                         | 50  |
|                            |                          | <a href="#">Published</a> | The Ministry of Environment +Minis                       |                | -           | Energy and Renewable Energies Technology Center | <u>م.م هند عامر مهدي</u><br><u>م.م رغد رحمان مهدي</u><br><u>أ.م.د احمد عبدالأله احمد</u>           | Exploring the Efficacy of polysaccharides as Green Corrosion Inhibitors: A Comprehensive Review | 51  |

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| Completion of months<br>12-10 | Completion of months<br>6-4 | Completion of months<br>1-3 | The beneficiary                              | kind of search |             | Affiliation                                     | Researcher                                                                                                                                                                                                                                   | Research Title                                                             | No. |
|-------------------------------|-----------------------------|-----------------------------|----------------------------------------------|----------------|-------------|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|-----|
|                               |                             |                             |                                              | Applied        | Theoretical |                                                 |                                                                                                                                                                                                                                              |                                                                            |     |
|                               |                             |                             | try of Health                                |                |             |                                                 | <u>أ.د احمد عبدالأمير</u>                                                                                                                                                                                                                    |                                                                            |     |
|                               | Published                   | <a href="#"><u>%70</u></a>  | Ministry of Health                           | -              |             | Energy and Renewable Energies Technology Center | AL-Samarrayi I Sh. A. ,<br>Al-Ithawi W.K.<br>A. Kopchuk D. S.,<br>Kovalev I. S.,<br>Krinochkin A.P.,<br>RybaKova S.S.,<br>Nikonov I.L.,<br>Zyryanov G.V.,<br>Pospelova T.A.,<br>Matern A.I                                                   | mechano)chemical modification of polyvinyl chloride with azole-based drugs | 52  |
|                               | 100% Send                   | <a href="#"><u>%60</u></a>  | Ministry of Environment + Ministry of Health | -              |             | Energy and Renewable Energies Technology Center | <u>Al-Ithawi W.K.A. , AL-Samarrayi I. Sh.</u><br><u>A. ,Arterm V.</u><br><u>Baklykov,Vadim</u><br><u>A.PLatonov ,Aqeel</u><br><u>m.K.Altobee,Nikita S.Glebov</u><br><u>,Albert</u><br><u>F.Khasanov, Kopchuk D. S.,</u><br><u>Kovalev I.</u> | Mechanosynthesis of pentiptycene-base polyesters and polycarbonates        | 53  |

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| Completion of months<br>12-10 | Completion of months<br>6-4 | Completion of months<br>1-3 | The beneficiary                              | kind of search |             | Affiliation                                     | Researcher                                                                                                                                                                                           | Research Title                                           | No. |
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|                               |                             |                             |                                              | Applied        | Theoretical |                                                 |                                                                                                                                                                                                      |                                                          |     |
|                               |                             |                             |                                              |                |             |                                                 | <u>S., Krinochkin A.P.,</u><br><u>RybaKova S.S.,</u><br><u>Nikonov I.L., Zyryanov G.V.,</u><br><u>Pospelova T.A., Matern A.I</u>                                                                     |                                                          |     |
|                               | Published                   | <a href="#">%65</a>         | Ministry of Environment + Ministry of Health | -              |             | Energy and Renewable Energies Technology Center | <u>Al-Ithawi W.K.A. ,</u><br>AL-Samarrayi I. Sh. A. ,<br>Kopchuk D. S.,<br>Kovalev I. S.,<br>Krinochkin A.P.,<br>RybaKova S.S.,<br>Nikonov I.L.,<br>Zyryanov G.V.,<br>Pospelova T.A.,<br>Matern A.I. | Mechanosynthesis of polymer $\alpha$ -amino phosphonates | 54  |

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| Completion<br>of months<br>12-10 | Completion<br>of months<br>6-4 | Completion<br>of months<br>1-3 | The<br>beneficiary | kind of search |             | Affiliation | Researcher | Research Title | No. |
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|                                  |                                |                                |                    | Applied        | Theoretical |             |            |                |     |

# Research Plan/ Energy and Renewable Energies Technology Center (2023/2024)

| Completion<br>of months<br>12-10 | Completion<br>of months<br>6-4 | Completion<br>of months<br>1-3 | The<br>beneficiary | kind of search |             | Affiliation | Researcher | Research Title | No. |
|----------------------------------|--------------------------------|--------------------------------|--------------------|----------------|-------------|-------------|------------|----------------|-----|
|                                  |                                |                                |                    | Applied        | Theoretical |             |            |                |     |