

# **CURRICULUM VITAE**

**Noureddine HAJJAJI**

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## I. FORMATIONS

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2017	Habilitation à Diriger des Recherches, <b>HDR</b> (Université de Lorraine) <i>Spécialité "Génie des Procédés &amp; des Produits"</i> .
2008-2011	Doctorat de l'Institut National Polytechnique de Lorraine (INPL) <i>Spécialité "Génie des Procédés &amp; des Produits"</i> . Doctorat de l'Ecole Nationale d'Ingénieurs de Gabès (ENIG) Tunisie <i>Spécialité "Génie Chimique-Procédés"</i> .
2003-2005	Qualifié en Ingénierie de formation Centre Universitaire de Coopération Economique et Sociale (CUCESS)-Henri Poincaré Nancy.
1999-2001	Diplôme des Etudes Approfondies (DEA)-ENIG <i>Spécialité "Génie Chimique-Procédés"</i>
2001	Diplôme Agrégation-ENIG <i>Spécialité "Génie Chimique-Procédés"</i>
1994-1997	Diplôme d'Ingénieur -ENIG <i>Spécialité "Génie Chimique-Procédés"</i>

## II. EXPERIENCE PROFESSIONNELLE

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2019- Présent	Expert Sénior Environnement chez "Green Footprint Consulting": Bilan et Empreinte Carbone, ACV & Economie Circulaire
2016-Présent	Professeur des Universités à l'ENIG- Département de Génie Chimique- Procédés Cours enseignés: <i>Opérations unitaires de génie des procédés.</i> <i>Agitation &amp; rhéologie</i> <i>Simulation des procédés</i> <i>Thermodynamique</i> <i>Changement climatique: Bilan et empreinte carbone</i> <i>ACV &amp; Economie Circulaire</i>
2015-2016	Post-doc INRA, Montpellier SupAgro, Laboratoire de Biotechnologie de l'Environnement
2011-2015	Maitre-assistant à l'ENIG- Département de Génie Chimique-Procédés
2009-2011	Maitre Technologue à l'Institut Supérieur des Etudes Technologiques de Gabès (ISETG). <u>Cours enseignés:</u> <i>Thermodynamique chimique</i> <i>Thermodynamique appliquée</i> <i>La cristallisation industrielle</i> <i>Economie d'énergie</i> <i>Management de l'environnement /ACV</i>
1999-2009	Technologue à l'ISETG

## III. RESPONSABILITES OCCUPEES

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2019-2021	Coordinateur de Mastère Génie Chimique-Procédés "Bioprocédés & Bioproduits"
2015-2018	Coordinateur de l'Unité de Recherche Catalyse et Matériaux pour l'Environnement et les Procédés (URCMEP).
2017-2018	Directeur technique du projet PEF-Tunisie (Product Environmental Footprint) Organisation des Nations Unies pour le Développement Industriel ( <b>ONU</b> DI).
2012-2014	Responsable du <b>B</b> ureau de <b>L</b> iaison <b>U</b> niversité- <b>E</b> ntreprise ( <b>BLEU</b> ) de l'ENIG
2004-2011	Coordinateur du service de Formation Continue de l'ISETG
2005-2008	Directeur du Département de Génie Chimique de l'ISETG
2006-2008	Membre de la commission de réforme LMD DGET- ISETG
2002-2005	Membre du conseil scientifique de l'ISETG

#### IV. COMPETENCES

<i>Scientifiques et techniques</i>	<p><b>Conception, simulation et étude des procédés</b> : maîtrise appréciable des logiciels Aspen Plus™ &amp; SimaPro®.</p> <p><b>Analyse Thermodynamique des procédés</b> : Energétique &amp; Exergétique.</p> <p><b>Filières bioénergie/ biofuels.</b></p> <p><b>Analyse de Cycle de Vie, ACV (norme ISO 14040-44)</b> : accompagnement des entreprises Tunisiennes dans le domaine de l'ACV.</p> <p><b>Expert Sénior "Empreinte Environnementale des Produits, PEF"</b></p> <p><b>Expert Sénior "Calcul Bilan/Empreinte carbone ISO 14064/ISO 14067"</b></p> <p><b>Economie Circulaire &amp; Economie Verte</b></p>
<i>Management de la recherche</i>	<p><b>Coordinateur de l'unité de recherche</b> Catalyse &amp; Matériaux pour l'Environnement &amp; les Procédés (URCMEP)</p> <p><b>Coordinateur du Groupe Tunisien de Recherche en Analyse de Cycle de Vie.</b></p>

#### V. ENCADREMENT THESES, MASTERS & PROJETS DE FIN D'ETUDES

##### V.1 Thèses

<i>Période</i>	<i>Titre</i>	<i>Etudiant</i>	<i>Remarque</i>	<i>Taux d'encadrement</i>
2011-2014	Analyse de cycle de vie eMergétique de système de valorisation de biomasse ( <b>soutenu le 16-12-2014</b> ).	Zouhour KHILA	Thèse en cotutelle internationale ENIG (Tun)/ Univ-Lorraine (Fr)	N. HAJJAJI (40%), M.N. PONS (40%), A. Houas (10%), A. DUFOUR (10%)
2014-2017	Analyse 4E (Energétique, Exergétique, Environnementale et Economique) de systèmes de valorisation énergétique de biomasses ( <b>soutenu le 21-12-2017</b> ).	Manel DAHMANI	Thèse en cotutelle internationale CNAM Paris (Fr) / ENIG (Tun)	N. HAJJAJI (40%), A. Houas, Pr, (10%) J. Descombe, Pr (50%)
2014-2017	Analyse de cycle de vie émergétique de système de valorisation de matières grasses. ( <b>Soutenu le 17-10-2018</b> )	Nahla FALAH	ENIG	N. HAJJAJI (90%), A. Houas, Pr, (10%)
2015-2018	Contribution au développement de la méthode d'analyse de cycle de vie exergétique (ACVE) appliquée aux produits industriels: cas des acides industriels	Soumaya ARIBI	ENIG	N. HAJJAJI (50%), MR JEDAY, Pr, (50%)

2015-2018	Contribution au développement de la méthode d'analyse de cycle de vie exergétique (ACVE) appliquée aux produits industriels: cas des engrais chimiques	Marwa MAMI	ENIG	N. HAJJAJI (50%), MR JEDAY, Pr, (50%)
2016-2019	Empreintes eau-carbone de la production de la tomate irriguée au sud de la Tunisie	Mereiem MAAOUI	ISSTEG	N. HAJJAJI (50%), R. BOUKHCHINA, MdC (50%)
2017-2021	Thermo-environmental investigation of synthetic fuels production from date palm waste	Kahoula BEN HNICH	ENIG	N. HAJJAJI (100%)
2017-2021	Environmental life cycle assessment of wastewater treatment systems in Tunisia.	Maha RADHOUANI	ISSTEG	N. HAJJAJI (50%), R. BOUKHCHINA, MdC (50%)
2019-2023	Modélisation et études de systèmes de transport de la pulpe de phosphate cas du Groupe Chimique Tunisien	Zeineb GHOUDI	ENIG	N. HAJJAJI (100%)
2019-2023	Contribution à l'étude de procédés de valorisation énergétique des déchets plastiques et similaires	Lotfi BRAHIM	ENIG	N. HAJJAJI (100%)

## V.2 Mastère

Période	Titre	Etudiant	Taux d'encadrement
2011-2012	Préparation et caractérisation de charbon actif : Valorisation de Déchets de palmiers.	Mariam RAJEH	N. HAJJAJI (80%), A. HOUAS (20%).
2011-2012	Conception et mise en place d'un contacteur solide liquide en mode continu: application au traitement tertiaire de l'eau.	Hemdia RAJEH	N. HAJJAJI (80%), A. HOUAS (20%).
2012-2013	Exergetic Life Cycle Assessment of hydrogen production scenarios via natural gas reforming.	Héla ATTIA	N. HAJJAJI, 100%
2012-2013	Analyse de cycle de vie exergétique de système de production d'hydrogène à partir du glycérol	Amna CHAHBANI	N. HAJJAJI, 100%
2012-2013	Etude de procédés de production d'hydrogène avec captage de dioxyde de carbone.	Ons GHRIS	N. HAJJAJI, 100%
2012-2013	Analyse de Cycle de Vie Exergétiques de systèmes de production d'hydrogène à partir des substances grasses.	Nahla FALAH	N. HAJJAJI, 100%
2020-2021	Études d'un procédé de compostage d'agro-résidus oasiens	Manel NCIB	N. HAJJAJI, 100%
2021-2022	Analyse de durabilité de produits cosmétique par une	Nawras BESSALAH	N. HAJJAJI, 100%

### **V.3 Projets de fin d'études**

Plus de 80 projets encadrés (ISETG & ENIG).

## **VI. COLLABORATIONS INTERNATIONALES**

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- Laboratoire de Biotechnologie de l'Environnement (LBE) Narbonne France.
- Laboratory of reactions and chemical engineering (LRGP) Nancy France
- Association Création Développement Eco-Entreprises: CD2E Lille, France.
- Conservatoire National des Arts & Métiers (CNAM)- Paris, France.
- Research Institute of Catalysis and Environment IRCE Lyon;
- Application Laboratory of Chemistry for the Environment(LACE) Univ. Lyon 1 France;
- Chemistry Laboratory of Water and Environment, CEAA ESI Poitiers France;
- Laboratory of Environmental Sciences and Spatial Planning, FS Angers France;
- Laboratory of Catalysis and Environment, LCE ESTFès Morocco;
- Laboratory for Environmental Biotechnology École Polytechnique Fédérale de Lausanne Switzerland;
- Ecosystem Environmental ServicesSA (ECOSYSTEM) Barcelona Spain.

## **VII. PRODUCTIONS SCIENTIFIQUES**

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### **VII.1 Chapitres de livre**

[1] Life Cycle Assessment of Di-Ammonium Phosphate (DAP) Fertilizer Production in Tunisia

Soumaya Aribi, Mohamed Razak Jday, and Nouredine Hajjaji

Recent Advances in Environmental Science from the Euro-Mediterranean and Surrounding Regions, pp 359-36

Springer International Publishing AG.

[2] Life Cycle Assessment of Sulfuric Acid Production System in Tunisia

Marwa Mami, Mohamed-Razak Jeday, and Nouredine Hajjaji

Recent Advances in Environmental Science from the Euro-Mediterranean and Surrounding Regions, pp. 483-485

Springer International Publishing AG.

[3] LCA and Cherry Tomato Production in the South of Tunisia

Recent Advances in Environmental Science from the Euro-Mediterranean and Surrounding Regions. pp. 1105-1106

EMCEI 2017. Advances in Science, Technology & Innovation (IEREK Interdisciplinary Series for Sustainable Development).

Springer International Publishing AG.

### **VII.2. Conférencier invité**

[1] Thermo-environmental life cycle analysis of hydrogen production from steam and autothermal reforming of bioethanol

4th International Congress on Energy Efficiency and Energy Related Materials (ENEFM)

October 01-05, 2016 in Oludeniz, Fethiye /Turkey

Nouredine Hajjaji

[2] Thermo-environmental life cycle analysis of hydrogen production process by reforming of bioethanol  
International Congress of Environmental Sciences and Technologies, January 13-15, 2017, Hammamet Tunisia.  
Noureddine Hajjaji

[3] Environmental life cycle assessment ISO 14040-44: Concept and illustrative examples  
Second International Congress on Energetic and Environmental Systems (IEES-2019)  
November 1-3, 2019 Hammamet, Tunisia.  
Noureddine Hajjaji

### **VII.3. Publications scientifiques**

[1] Factorial design of experiment (DOE) for parametric exergetic investigation of a steam methane reforming process for hydrogen production.  
HAJJAJI Noureddine, RENAUDIN Viviane, HOUAS Ammar, PONS Marie Noëlle  
Chemical Engineering and Processing 49 (2010) pp. 500–507.

[2] Exergy analysis: An efficient tool for understanding and improvement of hydrogen production via the Steam Methane Reforming process.  
HAJJAJI Noureddine, PONS Marie Noëlle, HOUAS Ammar, RENAUDIN Viviane  
Energy Policy 42 (2012), pp. 392-399.

[3] Hydrogen production via steam and autothermal reforming of beef tallow: A thermodynamic investigation.  
HAJJAJI Noureddine, PONS Marie Noëlle  
International Journal of Hydrogen Energy, 38 (2013) 2199-2211.

[4] Comparative Life Cycle Assessment of eight alternatives for hydrogen production from renewable and fossil feedstock”  
HAJJAJI Noureddine, Pons Marie-Noëlle, Renaudin Viviane, Houas Ammar  
Journal of Cleaner Production, 44 (2013) 177-189.

[5] A comparative study on energetic and exergetic assessment of hydrogen production from bioethanol via steam reforming, partial oxidation and auto-thermal reforming processes”  
KHILA Zouhour, HAJJAJI Noureddine, PONS Marie-Noëlle, RENAUDIN Viviane, HOUAS Ammar.  
Fuel Processing Technology, 112 (2013) 19–27.

[6] Thermodynamic analysis of hydrogen production by steam and autothermal reforming of soybean waste frying oil.  
HAJJAJI Noureddine, FALEH Nahla, KHILA Zouhour, PONS Marie-Noëlle.  
Energy Conversion and Management 70 (2013) 174–186.

[7] A comprehensive energy-exergy-based assessment and parametric study of a hydrogen production process using steam glycerol reforming”  
HAJJAJI Noureddine, CHAHBANI Amna, KHILA Zouhour, PONS Marie-Noëlle  
Energy 64 (2014) 473-483.

[8] Thermodynamic investigation and environment impact assessment of hydrogen production from steam reforming of poultry tallow.  
HAJJAJI Noureddine  
Energy Conversion and Management, 79 (2014) 171–179.

[9] Energy and exergy analysis as tools for optimization of hydrogen production by glycerol autothermal reforming.

HAJJAJI Nouredine, Ines BACCAR, PONS Marie-Noëlle  
Renewable Energy, 71 (2014) 368-380.

[10] Performance optimization of hydrogen production by autothermal reforming through energy and exergy analysis.

Ines BACCAR, Nouredine HAJJAJI, Zouhour KHILA  
Entropy

[11] Thermodynamic feasibility and life cycle assessment of hydrogen production via reforming of poultry fat.

HAJJAJI Nouredine, HOUAS Ammar, PONS Marie-Noëlle  
Journal of Cleaner Production, 134 Part B (2016) 600-612.

[12] Thermodynamic analysis of chemical looping reforming of waste cooking oil: Hydrogen production

FALEH Nahla, HAJJAJI Nouredine, PONS Marie-Noëlle  
South African Journal of Chemical Engineering, 21 (2016) 18-27.

[13] Life cycle assessment of hydrogen production from biogas reforming

HAJJAJI Nouredine, MARTINEZ Sylvain, TRABLY Eric, STEYER Jean-Philippe, HELIAS Arnaud.

International Journal of Hydrogen Energy, 41 (2016), 6064-6075

[14] A thermo-environmental study of hydrogen production from the steam reforming of bioethanol

HAJJAJI Nouredine, KHILA Zouhour, BACCAR Ines, PONS Marie-Noëlle  
Journal of Energy Storage, 7 (2016), 204-219.

[15] Idea, process and analyses of hydrogen production from atmospheric pollutant

Zina Meddeb, Hatem Hajjem, Aicha Mabrouk, Nouredine Hajjaji, Nejib Hajji  
International Journal of Hydrogen Energy, In Press, Available online 1 July 2016

[16] Energetic, exergetic and environmental life cycle assessment analyses of hydrogen production by autothermal reforming of bioethanol

KHILA Zouhour, BACCAR Ines, JEMEL Intidhar, HOUAS Ammar, HAJJAJI Nouredine  
International Journal of Hydrogen Energy, 41 (2016), 17723-17739.

[17] Study of Optimal Conditions of a Palm Waste Fixed Bed Gasifier for Power Generation  
Manel Dahmani, Christelle Périllon, Christophe Marvillet, Nouredine Hajjaji, Ammar Houas, Zouhour Khila

International Journal of Control Theory and Application, International Science Press, 9 (38), 2016, 233-238.

[18] Development of a fixed bed gasifier model and optimal operating conditions determination

Manel Dahmani, Christelle Périllon, Christophe Marvillet, Nouredine Hajjaji, Ammar Houas, and Zouhour Khila

AIP Conf. Proc. 1814, 020069-1–020069-7; Published by AIP Publishing.

[19] Thermo-environmental life cycle assessment of hydrogen production by autothermal reforming of bioethanol

Zouhour Khila, Ines Baccar, Intidhar Jemel, Nouredine Hajjaji  
Energy for Sustainable Development, 37 (2017) 66–78.

[20] Life Cycle Assessment of Di-Ammonium Phosphate (DAP) Fertilizer Production in Tunisia

Soumaya Aribi, Mohamed Razak Jday, and Nouredine Hajjaji  
Recent Advances in Environmental Science from the Euro-Mediterranean and Surrounding  
Regions, Springer International Publishing AG.

[21] An Environmental Life Cycle Assessment of an Industrial System: Case of Industrial  
Sulfuric Acid

Mami Marwa, Aribi Soumaya, Nouredine Hajjaji, and Mohamed Razak Jeday  
International Journal of Energy, Environment, and Economics, 25 (2019).

[22] Life Cycle Assessment of Sulfuric Acid Production System in Tunisia

Marwa Mami, Mohamed-Razak Jeday, and Nouredine Hajjaji  
Recent Advances in Environmental Science from the Euro-Mediterranean and Surrounding  
Regions, Springer International Publishing AG.

[23] Exergo-environmental life cycle assessment of biodiesel production from sheep tallow  
transesterification

Nahla EL FALEH, Zouhour KHILA, Marie-Noëlle PONS, Nouredine HAJJAJI  
Renewable Energy (127), 2018, 74-83

[24] Exergetic analysis of bioethanol production from Tunisian waste dates

Wahada Zeineb, Khila Zouhou, Louhichi Boulbab, Boukchina Rachid and Hajjaji  
Nouredine  
The Open Waste Management Journal (11), 2018.

[25] Life cycle assessment (LCA) of a wastewater treatment system

Sina Oueriemi, Nouredine Hajjaji  
International Journal of Applied Research and Technology (2), 2019

[26] Exergetic and environmental life cycle assessment analyses of LPG production

Haifa FITOURI, Mohamed-Razek JEDAY, Nouredine HAJJAJI  
International Journal of Energy, Environment, and Economics (25), 2019.

[27] Field to farm life cycle assessment of phosphate fertilizer production: a Tunisian case  
study

Soumaya ARIBI, Marwa MAMI, Riham NJIMA, Mohamed Razak JDAY, Nouredine HAJJAJI  
International Journal of Energy, Environment, and Economics (25), 2019.

[28] Environmental life cycle assessment of Mediterranean tomato: Case study of a Tunisian  
soilless geothermal multi-tunnel greenhouse

Meriem MAAOUI, Rachid BOUKHCHINA, Nouredine HAJJAJI  
Environment, Development and Sustainability, Springer (January) 2020.

[29] Comprehensive study of three configurations coproducing synthetic fuels and electricity  
from palm residue via Fischer-Tropsch process

Khaoula BEN HNIC, Zouhour KHILA, Nouredine HAJJAJI  
Energy, 205(15) 2020: 118027.

[30] Integrating life cycle assessment and emergy analysis for evaluation of H<sub>2</sub> production  
from sheep tallow

Nahla ELFELLAH, Zouhour KHILA, Nouredine HAJJAJI  
Clean Technology, MDPI (submitted).

[31] Life cycle sustainability assessment of synthetic fuels from date palm waste

Khaoula Ben Hnich, Mario Martín-Gamboa, Zouhour Khila, Nouredine Hajjaji, Javier  
Dufour, Diego Iribarren  
Science of the Total Environment 796, 2021:48961.



[32] Environmental Life Cycle Assessment of Second-Generation Bioethanol from Tunisian Waste Dates

Ines BACCAR, Khaoula BEN HNICH, Zouhour KHILA, Marie-Noëlle PONS, Mehrez ROMDHANE, Nouredine HAJJAJI  
Bioenergy research (February 2022).

[33] A New Rheological Model for Phosphate Slurry Flows

Zeineb Ghoudi, Souhail Maazioui, Fayssal Benkhaldoun, and Nouredine Hajjaji  
Fluids-MDPI, January 2023.

[34] Sustainability evaluation of H<sub>2</sub> production from sheep tallow by combining Emergy and environmental life cycle assessment

N El Faleh, K Ben Hnich, Z Khila, N Hajjaji  
International Journal of Environmental Science and Technology 20 (4), 2023

[35] Towards the modeling of the effect of turbulent water batches on the flow of slurries in horizontal pipes using CFD

Z Ghoudi, F Benkhaldoun, F Piscaglia, N Hajjaji  
European Journal of Mechanics-B/Fluids 100, 208-222, 2023

[36] OpenFOAM simulation of two phase flow development in a horizontal pipe

G Zeineb, B Fayssal, N Hajjaji  
AIP Conference Proceedings 2849 (1), 2023

[37] A techno economic and environmental assessment of a hybrid waste tires-renewable system for sustainable energy supply

L Brahim, MS Mosbah, Z Khila, N Hajjaji  
Environmental Progress & Sustainable Energy 42 (6), 2023

[38] Critical Reviews and Benchmarking Tunisian Clinker and Cement with Life Cycle Assessment Results

M Cherni, A Sebei, B Amor, N Hssine, N Hajjaji  
Case Studies in Construction Materials, 2024

#### **VII.4. Conférences avec proceeding**

[1] Design, manufacture and experiment of a new adsorption column operating in continuous mode”

HAJJAJI Nouredine, BACCAR Ines, HOUAS Ammar  
VIIIème Symposium International Environnement, Catalyse et Génie des Procédés (ECGP'8-2009; 14-15 Avril 2009- Djerba Tunisie)

[2] Energetic and exergetic studies for evaluation of three methane reforming processes for hydrogen production”

HAJJAJI Nouredine, KHILA Zouhour, PONS Marie Noëlle, HOUAS Ammar, RENAUDIN Viviane  
2nd International Conference on Hydrogen Energy ICHE10 Hammamet, Tunisie 9-11 mai 2010.

[3] Exergy balance of hydrogen production process by catalytic reforming”

Marseille, France Octobre 2009  
HAJJAJI Nouredine, PONS Marie Noëlle, HOUAS Ammar, RENAUDIN Viviane  
XIIème Congrès de la Société Française de Génie des Procédés (SFGP 2009).

- [4] IS BIOETHANOL SUSTAINABLE? A LIFE CYCLE ASSESSMENT VIEWPOINT”  
HAJJAJI Nouredine, Khila Zouhour, PONS Marie Noëlle, HOUAS Ammar, RENAUDIN Viviane  
Life Cycle Assessment (LCA) conference, Lille 2012 (France)
- [5] Energy and exergy analysis of electricity generation from Tunisian agricultural waste”  
Zouhour KHILA, Nouredine HAJJAJI, Jessica François, Anthony Dufour, Marie-Noëlle Pons, Ammar HOUAS  
Congrès de la Société Française de Génie des Procédés (SFGP 2013).
- [6] Thermodynamic equilibrium analysis of hydrogen production from waste sunflower frying oil  
Nouredine HAJJAJI, Zouhour KHILA, Ammar HOUAS  
International Chemical Engineering Congress, Djerba 2013 (Tunisia)
- [7] An exergetic life cycle assessment for improving hydrogen production by Steam Methane Reforming”  
HAJJAJI Nouredine, PONS Marie Noëlle, HOUAS Ammar, RENAUDIN Viviane  
World Hydrogen Energy Conference WHEC 2010, Essen, Allemagne 16-21 mai 2010.
- [8] Energy valorization of biomass”  
Renewable Energy: Theory and application. Djerba Tunisia Mai 2013.  
HAJJAJI Nouredine, KHILA Zouhour
- [9] Exergetic Life Cycle Assessment of hydrogen production system from partial oxidation of natural gas and air  
VII ème Congrès International sur les Énergies Renouvelables et l’Environnement, 19,20 et 21 Mars 2013 à Sousse Tunisie.  
ATTIA Hela, HAJJAJI Nouredine, HOUAS Ammar
- [10] Steam and autothermal reforming of sheep tallow as new routes to renewable hydrogen production: A thermodynamic analysis”.  
HAJJAJI Nouredine, FALEH Nahla, KHILA Zouhour, HOUAS Ammar  
2nd International Symposium on Green Chemistry Renewable carbon and Eco-Efficient Processes, La Rochelle 2013, France
- [11] Thermodynamic analysis of carbon deposit formation during biomass syngas methanation”  
Zouhour KHILA, HAJJAJI Nouredine, Jessica François, Anthony Dufour, PONS Marie Noëlle, HOUAS Ammar.  
9th European Congress of Chemical Engineering/2nd European Congress of Applied Biotechnology, The Hague The Netherland 2013.
- [12] Life cycle assessment of electricity generation in Tunisia: center of electricity production of Rades, Tunisia  
HAJJAJI Nouredine, Zouhour KHILA, Ammar HOUAS  
Congrès de la Société Française de Génie des Procédés (SFGP 2013).
- [13] Chicken tallow as a promising feedstock for renewable hydrogen production: A thermodynamic investigation”  
Nouredine HAJJAJI, Zouhour KHILA, Ammar HOUAS  
International Chemical Engineering Congress, Djerba 2013 (Tunisia).
- [14] Life Cycle Assessment of hydrogen production via reforming of poultry fats”  
Nouredine Hajjaji, Ines Baccar and Zouhour Khila  
Life Cycle Assessment (LCA) conference, Lille 2014 (France).

[15] Performance optimization of hydrogen production by glycerol autothermal reforming through energy and exergy analysis.  
Ines BACCAR, Noureddine HAJJAJI, Zouhour KHILA  
The 13th Joint European Thermodynamics Conference JETC2015, 20 →22 Mai 2015, Nancy (France).

[16] Analyse de Cycle de Vie (ACV) ISO 14040: outil de développement durable"  
Noureddine HAJJAJI, Ines BACCAR, Zouhour KHILA  
Energies Renouvelables et leurs Applications, Djerba, 11→13 Février 2015.

[17] Biomasse caractérisation& voies de valorisation"  
Zouhour KHILA, Ines BACCAR, Noureddine HAJJAJI  
Energies Renouvelables et leurs Applications, Djerba, 11→13 Février 2015.

[18] Thermodynamic analysis of hydrogen production from chemical looping reforming of waste cooking oil  
Nahla El Faleh, Noureddine Hajjaji, ZouhourKhila  
IXth International Congress on Renewable Energy and the Environment, Hammamet 2015 (Tunisia).

[19] Etude de cas d'une ACV d'un produit industriel : cas d'une centrale à cycle combiné en Tunisie"  
Noureddine Hajjaji  
Séminaire Analyse de Cycle de Vie Exergétique (ACVEx), Tunis, 24 & 25 Mars 2015.

[20] Etude de cas d'une ACV émergétique : cas du Gaz Naturel Synthétique (SNG)"  
Zouhour KHILA, Noureddine HAJJAJI  
Séminaire Analyse de Cycle de Vie Exergétique (ACVEx), Tunis, 24 & 25 Mars 2015.

[21] Prise en compte des impacts environnementaux de cycle de vie de produits/services selon les normes ISO 14040-44  
Noureddine HAJJAJI, Zouhour KHILA, Ines BACCAR  
Energies Renouvelables et leurs Applications, Tozeur, 21→23 Février 2016.

[22] Valorisation thermochimique de la biomasse: Production d'électricité et gaz naturel synthétique (SNG)  
Zouhour KHILA, Noureddine HAJJAJI, Ines BACCAR  
Energies Renouvelables et leurs Applications, Tozeur, 21→23 Février 2016.

[23] Study of optimal conditions of a palm waste fixed bed gasifier for power generation"  
Manel DAHMANI, Christelle PERILHON, Christophe MARVILLET, Noureddine HAJJAJI, Ammar HOUAS, Zouhour KHILA  
3rd International Conference on Green Energy and Environmental Engineering (GEEE-2016) 23-25 April 2016 -Hammamet-Tunisia.

[24] Analyse émergétique de production de gaz naturel synthétique SNG à partir de la biomasse"  
Zouhour KHILA, Ines BACCAR, Noureddine HAJJAJI  
Workshop Bioprocédés: Energie & Environnement, 29 Avril-01 Mai 2016- Zarzis-Tunisie.

[25] Optimisation des paramètres opératoires d'un gazéifieur des déchets de palmiers à lit fixe"  
DAHMANI Manel, HOUAS Ammar, , KHILA Zouhour, MARVILLET Christophe, PERILHON Christelle, HAJJAJI Noureddine  
Workshop Bioprocédés: Energie & Environnement, 29 Avril-01 Mai 2016- Zarzis-Tunisie.

[26] Coupling process simulation and life cycle assessment: applications to bio-based process investigation"

Ines BACCAR, Zouhour KHILA, Nouredine HAJJAJI

Workshop Bioprocédés: Energie & Environnement, 29 Avril-01 Mai 2016- Zarzis-Tunisie.

[27] Life cycle assessment of phosphoric acid production system in Tunisia

Riham Njima, Mohamed Razak Jeday , Naem Adibi, Nouredine Hajjaji

International Congress of Environmental Sciences and Technologies, 13,14,15 January 2017, Hammamet Tunisia.

[28] Environmental life cycle assessment of a drinking water production system in Tunisia

Sina Oueriemi, Zouhour Khila, Nouredine Hajjaji

International Congress of Environmental Sciences and Technologies, 13,14,15 January 2017, Hammamet Tunisia.

[29] Comparative life cycle assessment of four alternatives of fatty material-based H<sub>2</sub> systems

Nahla EL FALEH, Nouredine HAJJAJI

International Congress of Environmental Sciences and Technologies, 13,14,15 January 2017, Hammamet Tunisia.

[30] Application of life cycle assessment to diammonium phosphate fertilizer (DAP) production in Tunisia"

Soumaya Aribi, Mohamed Razak Jeday, Naem Adibi, Nouredine Hajjaji.

International Congress of Environmental Sciences and Technologies, 13,14,15 January 2017, Hammamet Tunisia.

[31] Life Cycle Analysis of the Biogas biogas production system"

Fatma Mokhtari, Mohamed Razak Jeday, Nouredine Hajjaji

International Congress of Environmental Sciences and Technologies, 13,14,15 January 2017, Hammamet Tunisia.

[32] Environmental life cycle assessment of Synthetic Natural Gas (SNG) production from date palm wastes"

Zouhour Khila, Ines Baccar, Nouredine Hajjaji

International Congress of Environmental Sciences and Technologies, 13,14,15 January 2017, Hammamet Tunisia.

[33] Thermo-environmental life cycle analysis of hydrogen production process by reforming of bioethanol"

Nouredine Hajjaji, Zouhour Khila, Ines Baccar

International Congress of Environmental Sciences and Technologies, 13,14,15 January 2017, Hammamet Tunisia.

[34] Evaluation de l'Empreinte Carbone dans une station de traitement des eaux usées à Gabès"

Maha Radhouani, Nouredine Hajjaji , Rachid Boukhcina

International Symposium on Water Resources and the Climate Impact in North Africa, WREIANA 24-26 March 2017- Gafsa-Tunisia.

[35] Environmental life cycle assessment of a soilless geothermal greenhouse tomato production in the south of Tunisia".

Meriem Maaoui, Rachid Boukhcina, Nouredine Hajjaji

Conférence Scientifique Internationale sur l'Environnement et l'Agriculture 24-25 Avril 2017 Hammamet, Tunisie.

[36] Energetic and exergetic analysis of a small scale biomass gasification power plant".

Manel Dahmani, Christophe Marvillet, Christelle Perilhon, Ammar Houas, Nouredine Hajjaji, Zouhour Khila.  
4th International Conference on Green Energy and Environmental Engineering (GEEE-2017)  
22-24 Avril 2017- Sousse-Tunisie.

[37] Contribution au développement de l'application de la méthode d'analyse de cycle de vie exergétique (ACVEx) aux produits industriels : cas des Gaz de Pétrole Liquéfiés (GPL)  
Haifa Fitouri, Mohamed Razek Jeday, Nouredine Hajjaji  
6th International conference on Green Energy and Environmental Engineering Tabarka

[38] Cradle to gate environmental investigation inventory for the production of the DAP fertilizers in Tunisia  
Soumaya ARIBI, Mohamed Razak JEDAY, Nouredine HAJJAJI, Naeem ADIBI  
Congrès[avniR] Novembre 2016 Lille-France

[39] Application de la méthode de l'Analyse de Cycle de Vie aux engrais chimiques (DAP)  
S. ARIBI, M.R. JEDAY, N. HAJJAJI  
ICEST 13, 14 et 15 Janvier 2017 Hammamet-Tunisie

[40] Life Cycle Assessment of Di-Ammonium Phosphate (DAP) Fertilizer Production in Tunisia  
S. ARIBI, M.R. JEDAY, N. HAJJAJI  
Congrès EMCEI 22, 23, 24 et 25 Novembre 2017

[41] Environmental life cycle assessment of a soilless geothermal greenhouse tomato production in the South of Tunisia.  
Meriem Maaoui, Rachid Boukchina, Nouredine Hajjaji  
Conférence Scientifique Internationale sur l'Environnement et l'Agriculture 24-25 avril  
Hammamet Tunisie

[42] LCA and Cherry Tomato Production in the South of Tunisia  
Meriem Maaoui, Rachid Boukchina, Nouredine Hajjaji  
Euro-Mediterranean conference for environmental integration EMCEI 20-25 November  
2017; Sousse, Tunisia.

[43] The contribution of the thermo-environmental Life Cycle Assessment of an industrial system : the case of Tunisian sulfuric acid  
Mami Marwa, Hajjaji Nouredine, Jeday Mohamed Razak  
6th International Conference on Green Energy and Environmental Engineering GEEE-2019 Tabarka/27-29 Avril 2019

[44] Thermo-environmental Life Cycle Assessment of an industrial sulfuric acid  
Mami Marwa, Hajjaji Nouredine, Jeday Mohamed Razak  
2nd International Congress of Environmental Science & Technology ICEST  
Hammamet/3-5 Mai 2018

[45] Life cycle assessment of sulfuric acid production system in Tunisia  
1st Euro-Mediterranean conference for environmental integration EMCEI EMCEI 2017  
Sousse/22-25 Novembre  
Mami Marwa, Hajjaji Nouredine, Jeday Mohamed Razak

[46] Essai de l'évaluation de l'Empreinte Carbone dans une station de traitement des Eaux usées à Gabes.  
Maha Radhouani, Rachid Boukchina, Nouredine Hajjaji  
1er colloque national WERIANA, Mars 2017

[47] VI Young Researchers-Science Meeting, Spain  
Maha Radhouani, Nouredine Hajjaji, Rachid Boukchina  
LCA of wastewater treatment systems: case study of the WWTP of south Rades Meliane, Tunisie, Mai 2018.

[48] Comparison of municipal wastewater treatment plants in Rades (Tunisia and Cadiz (Spain)

Maha Radhouani, Rachid Boukchina, Nouredine Hajjaji  
II Symposium Research in Environmental Technologies “, Juin 2018.

### VII.5 Conferences sans presentations







[1] Exergetic Life Cycle Assessment (ELCA) of hydrogen production processes”  
HAJJAJI Nouredine, PONS Marie Noëlle, HOUAS Ammar, RENAUDIN Viviane  
Séminaire de l’Ecole Doctorale Science, Génie et Société Gabès, Tunisie 29 mai 2009

[2] Biogas production by anaerobic digestion: technology and environmental aspects”  
HAJJAJI Nouredine, RENAUDIN Viviane, HOUAS Ammar, PONS Marie Noëlle  
Séminaire de l’Ecole Doctorale RP2E Nancy, France 28 janvier 2010

[3] Thermo-environmental analysis of hydrogen production process from biogas reforming”  
Nouredine HAJJAJI, Sylvain MARTINEZ, Eric TRABLY, Jean-Philippe STEYER, Arnaud HELIAS  
Séminaire scientifique interne SSI, Narbonne, 14 & 15 Janvier 2016.

### VIII REFERENCES

La liste des entreprises/structures formées et/ou accompagnées.

	Company /Sector	Project/Action implemented	Date	Task
	The members of The German-Tunisian Chamber of Industry and Commerce (AHK Tunisia)	Understanding and carrying out a GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards.	November 18-20, 2024	Training Series
	United Nations Development Programme	Implementation of a calculation module for the “Carbon Footprint of an industrial entity” in Tunisia	September 2024	Software development
	German Corporation for International Cooperation GmbH	Training of 45 public-private experts on carbon accounting	July 2024	Training
	Market Access Project for Agri-Food and Local Products (PAMPAT 2)	Understanding and carrying out a GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards.	June 2024	Training series
	The members of The French-Tunisian Chamber of Industry and Commerce (CTFCI)	Understanding and carrying out a GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards.	Mai 2024	Training series
	French Development Agency	Development of the Environmental and Societal Management System for Tunisian Commercial Maritime Ports	March 2024	Development of carbon footprints and action plans for ports of the Office of Merchant Marine and Ports (OMMP): Port of Bizerte-Menzel

				Bourguiba, la Goulette, Radès, Sousse, Sfax -Sidi Youssef, Gabès, Zarzis.
	The members of The German-Tunisian Chamber of Industry and Commerce (AHK Tunisia)	Understanding and carrying out a GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards.	March 06-08, 2024	Training Series
 	National Agency for Energy Conservation  German Corporation for International Cooperation GmbH	Animation of four exchange and information workshops on carbon accounting	February 20, 2024  March 04, 2024 ***	Scientific and technical animation of the workshops
	Next Protein – Agricultural and agro-industry	Environmental Life Cycle Assessment LCA ISO 14040-44	February 2024	Accompaniment
	The members of The German-Tunisian Chamber of Industry and Commerce (AHK Tunisia)	Understanding and carrying out a GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards.	February 07-09, 2024	Training Series
	German Corporation for International Cooperation GmbH	Carbon Border Adjustment Mechanism CBAM	December 2023	Seminar
	Agro-industrial – Group <b>Seven</b> companies: - SBC - CLSB - CLN - CF - SDEM - Delta Plastic - CLC	Accompaniment for GHG inventory calculation according to ISO 14064	January 2023	Accompaniment
	German Corporation for International Cooperation GmbH	Project: Circular economy for Tunisian industry - training advanced in Life Cycle Analysis and Ecodesign for 20 public and private experts	January 2024- December 2025	Accompaniment
	Industrial & logistics	Understanding and carrying out a GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards.	November 2023	Training
	German Corporation for International Cooperation GmbH	Project: Decarbonization of Industry sectoral in Tunisian – Textile, IAA and Chemical sectors	September 2023- September 2024	Accompaniment
	The members of The German-Tunisian Chamber of Industry and Commerce (AHK Tunisia)	The carbon tax at the EU borders: what challenges for Tunisian companies?	November 2023	Seminar
	The members of The French-Tunisian Chamber of Industry and Commerce (CTFCI)	Understanding and carrying out a GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards.	October 2023	Training series

	Trade union and civic employers' organization	The carbon tax at the EU borders: what challenges for Tunisian companies?	October 2023	Seminar
	<b>Group</b> Tunisian company for modern packaging or STEM, Tunisian cardboard, Magiplast, El Maaden Company, Mövenpick, Radisson, Carrefour, supermarchés, Champion	The carbon tax at the EU borders: what challenges for Tunisian companies?	September 2023	Conference
	Automotive industry	Understanding and carrying out a GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards.	September 2023	Training
	Various industrial activities Seven industrial companies: <i>TTEI</i> <i>EOT</i> <i>FUBA</i> <i>TPI</i> <i>ELFX</i> <i>TC</i> <i>OTMA</i>	Accompaniment for carbon product footprint ISO 14067 and corporate carbon footprint calculations according to ISO 14064	August 2023	Accompaniment
	Textile	Understanding and carrying out a GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards.	August 2023	Training
	Automotive industry	Understanding and carrying out a GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards.	August 2023	Training
	Research Institute	Life Cycle Assessment ISO 14040-44	August 2023	Training
	Trade union and civic employers' organization	The carbon tax at the EU borders: what challenges for Tunisian companies?	July 2023	Seminar
	Chemical Industry	Accompaniment for carbon product footprint ISO 14067 and corporate carbon footprint calculations according to ISO 14064	July 2023	Accompaniment
	Paint industry- <b>Morocco</b>	Understanding and carrying out a GHG inventory calculation / footprint according to ISO 14064 and ISO 14067 standards.	July 2023	Training
	Various: bank, business, insurance, oil and Gas.	Understanding and carrying out a GHG inventory calculation / footprint according to ISO 14064 and ISO 14067 standards.	July 2023	Training
	Agro-industrial	Accompaniment for GHG inventory calculation according to ISO 14064	June 2023	Accompaniment



 TTE International A Onetech company	Electro-mechanical sub-assemblies and wire harnesses	Carbon footprint calculation using SimaPro software	June 2023	
	Agro-industry	Accompaniment for carbon footprint calculation according to ISO 14067	June 2023	Accompaniment
	The members of The French-Tunisian Chamber of Industry and Commerce (CCTFCI)	Understanding and carrying out a GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards.	June 2023	Training series
	SUNREF Program Bank : UIB, UBCI & Amen Bank	Crabon Tax calculation	May 2023	Coaching team
	The members of The French-Tunisian Chamber of Industry and Commerce (CCTFCI)	Understanding and carrying out a GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards.	May 2023	Training series
	Chemistry	Accompaniment for GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards calculation	May 2022	Accompaniment
	Understanding and carrying out a GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards.	Understanding and carrying out a GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards.	May 2023	Training
	Chemical Industry	Understanding and carrying out a GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards.	April 2023	Training
	Bank	Understanding and carrying out a GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards.	March 2023	Training
	The members of The French-Tunisian Chamber of Industry and Commerce (CCTFCI)	Understanding and carrying out a GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards.	March 2023	Training series
	Wires and Cables industry	Understanding and carrying out a GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards.	January 2023	Training
 	Aviation mechanical parts	Accompaniment for GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards calculation	September 2022	Accompaniment
	Plastic industry	Understanding and carrying out a GHG inventory calculation / footprint according to ISO 14064 and ISO 14067 standards.	November 2022	Training
	Chemistry	Accompaniment for GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards calculation	November 2022	Accompaniment


	Plastic industry	Understanding and carrying out a GHG inventory calculation / footprint according to ISO 14064 and ISO 14067 standards.	October 2022	Training
	Capgemini Engineering - Casablanca Morocco	Training an coaching team Understanding and carrying out a GHG inventory calculation / footprint according to ISO 14064 and ISO 14067 standards.	September 2022	Training an coaching team
	Metallurgy	Accompaniment for GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards calculation	August 2022	Accompaniment
	Metallurgy	Accompaniment for GHG inventory calculation / carbon footprint according to ISO 14064 and ISO 14067 standards calculation	July 2022	Accompaniment
   الاتحاد الدولي للبنوك UNION INTERNATIONALE DE BANQUES	Bank	Understanding and carrying out a GHG inventory calculation / footprint according to ISO 14064 and ISO 14067 standards.	06, 20-22, 2022	Training
	Chemistry	Understanding and carrying out a GHG inventory calculation / footprint according to ISO 14064 and ISO 14067 standards.	06, 06-07, 2022	Coaching
	Consulting - Morocco	Understanding and carrying out a GHG inventory calculation / footprint according to ISO 14064 and ISO 14067 standards.	May, 2022	Training
 Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH	German Corporation for International Cooperation GmbH	Environmental impact and Circular Economy in hotel sector	03, 28-29, 2022	Training
	SUNREF program: financed by Agence Française de Développement (AFD) Group funds - ANME - ANPE	Coaching multidisciplinary group on understanding and carrying out a GHG inventory calculation / footprint according to ISO 14064 and ISO 14067 standards.	05, 30-31 and 06, 01	Training
	Various sectors	Understanding and carrying out a carbon balance / footprint according to ISO 14064 and ISO 14067 standards.	05, 16-18, 2022 Mohammed Morroco	Training
  		Understanding and carrying out a GHG inventory calculation / footprint according to ISO 14064 and ISO 14067 standards.	03, 28-30, 2022	Training

				
  	Telecommunication / Industry	Understanding and carrying out a GHG inventory calculation / footprint according to ISO 14064 and ISO 14067 standards.	03, 9-11, 2022	Training
 Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH	German Corporation for International Cooperation GmbH	Environmental impact and Circular Economy in hotel sector	03, 7-8, 2022	Coatch
 الجمعية التونسية لتدريب المدارس العليا الفرنسية ASSOCIATION DES TUNISIENS DES GRANDES ÉCOLES	ATUGE, Association des Tunisiens des Grandes Écoles	Carbon Border Adjustment Mechanism - European Commission # carbon balance / footprint according to ISO 14064 and ISO 14067 standards.	03-01-2022	Webinar Expert
 JUNIOR ENTERPRISES OF TUNISIA	Industry Business	Carbon Border Adjustment Mechanism - European Commission	02-23-2022	Expert
	AfricInvest /Business	Understanding and carrying out a GHG inventory calculation / footprint according to ISO 14064 and ISO 14067 standards.	02, 8-10, 2022	Training
 Deutsche Industrie- und Handelskammer in Marokko Chambre Allemande de Commerce et d'Industrie au Maroc	German Chamber of Commerce and Industry in Morocco	The importance of decarbonization of producing entities in Morocco	2022	Webinar Main Speaker More than 220 participants
 الجمهورية التونسية GROUPE CHIMIQUE TUNISIEN	Tunisian Chemical Group / Fertilizer	Understanding and carrying out a GHG inventory calculation / footprint according to ISO 14064 and ISO 14067 standards.	2022	- Training
 The Chemical Company	BASF/ Chemical	Understanding and carrying out a GHG inventory calculation / footprint according to ISO 14064 and ISO 14067 standards.	2021	Training and Technical support
 	Various: bank, business, insurance, consulting.	Understanding and carrying out a GHG inventory calculation / footprint according to ISO 14064 and ISO 14067 standards.	2021	Training
 Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH	German Corporation for International Cooperation GmbH	Socially sustainable promotion and development of tourism in Tunisia (15 hotels)- Expert Key Consulting	2021	Technical support in sustainability
 Jeans, Casual, Knits and Sportswear Manufacturing	Textile	Quantification of the carbon footprint of products according to ISO14067-V2018	2021	Training and technical support

	Agri-Food	Quantification of the carbon footprint of products according to ISO14067-V2018	2021	Training and technical support <b>Délice group</b>
	Technical center	Quantification of the carbon footprint of products according to ISO14067-V2018	2021	Training of <b>CITET technical staff</b>
<b>8</b>	Industrial	Support of 04 companies for the Quantification of the carbon footprint of products according to the ISO14067-V2018 standard	2020	Support
	Consulting	Carbon footprint and carbon balance	2020	Training of industrial staffs
	Consulting	Carbon footprint and carbon balance	2019	Training of industrial staffs
 	Agri-Food	Product Environmental Footprint PEF: Olive oil <sup>1</sup>	2017-18	<b>Technical team leader</b>  MEDT TEST II Project-SWITCHMED Initiative (www.switchmed.eu) Financed by the European Union.
 	Agri-Food	Product Environmental Footprint PEF: Pasta (WARDA)	2017-18	<b>Technical team leader</b>  MEDT TEST II Project-SWITCHMED Initiative (www.switchmed.eu) Financed by the European Union.
 	Agri-Food	Product Environmental Footprint PEF: Dairy product (yogurt)	2017-18	<b>Technical team leader</b>  MEDT TEST II Project-SWITCHMED Initiative (www.switchmed.eu) Financed by the European Union.
<b>14</b>	Academic	Carbon footprint and carbon balance	2018	Coaching of Research group laboratory LRCMEP
	Agricultural	Life Cycle Assessment (LCA) ISO 14040-44 of pomegranates in Gabès region -Tunisia	2017	Action P21 PGE (Environmental Governance Program): Agro-ecology for a Renaissance of the Oasis Ecosystem) "Green Lung" of the Governorate of

<sup>1</sup> Les trois études PEF ont été effectuées dans une perspective **d'Economie Circulaire**

				Gabès funded by the European Union.
	Ciment factory of Gabès	Environmental life cycle assessment (LCA) ISO 14040-44 of substitution of natural gas with petcoke within the Cement Company of Gabès.	2019	Recommended by the municipality of Gabès following the protests caused by the discharge of Petcoke on the port of Gabès.
	Textile	Calculation of the carbon credit of DREAM IN TUNISIA & DEMCO Group companies	2019	Support for DREAM IN TUNISIA & DEMCO Group companies in calculating the carbon credit.
	Agri-Food	Construction of the environmental balance sheet of food by Life Cycle Assessment	2019	INNOV project - INRA meta-program - Rennes France
	Ciment factory of ENFIDA	Environmental Life Cycle Assessment of Cement production "Company of Cement Enfidha -Tunisia"	2018	Engineer Graduation Project ENIG - Enfidha Cement Company
	Tunisian Chemical Group / fertilizer Fertilizers	Life Cycle Assessment ISO 14040-44 of chemical fertilizer: case of DAP	2018	Research agreement - ENIG-GCT (Chemical Tunisian Group)
	National Water Distribution Utility of Tunisia/ Water	LCA of a drinking water production system in Tunisia (SONEDE Tunisia)	2018	SONEDE-ENIG & ISET
	Tunisian Company of Electricity and Gas / Electrical Energy	Life Cycle Analysis of LPG (Liquefied Petroleum Gas)	2017	Research agreement STEG - ENIG
23	Agri-food	Environmental footprint of bread consumption in Tunisia.	2017	Research work ENIG- Bakery in Gabès
	Agricultural	Carbon footprint of greenhouses tomatoes "case of the Tuniso-Dutch company Desertjoy"	2016	Research agreement ENIG-Desertjoy
	Chemistry/ surfactant	LCA of surfactants from macro-algae	2016	Consortium of five public and private partners for total funding of € 820k. INRA Montepplier-France
	Energy	LCA of electricity production in Tunisia: case of the Rades electricity production center	2012	Research agreement STEG - ENIG
	Agri-food	Life Cycle Assessment (LCA) of a sugar production system in GINOR (Société Général Industrie du Nord-Jendouba)	2013	Research agreement GINOR - ENIG

	Tunisian Chemical Group / fertilizer	Contribution to the life cycle assessment of a phosphate chemical fertilizer: case of the triple super phosphate produced by the Tunisian Chemical Group.	2013	Research project CITET-ENIG & GCT
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