

Eskinder D. Gemechu, PhD

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PROFESSIONAL PROFILE/AREAS OF EXPERTISE

- Senior sustainability professional with 15+ years of international experience in life cycle assessment (LCA), techno-economic assessment, environmental management, sustainability reporting, energy modelling, policy and scenario analysis, GHG accounting, and applied research.
- Proven expertise in delivering data-driven insights, strengthening sustainability metrics, and supporting organizations in achieving climate, circular economy, and ESG objectives.
- Demonstrated expertise in conducting ISO 14040/44-compliant LCAs and EN 15804-based studies, including the preparation, critical review, and verification support of 20+ LCA reports and Environmental Product Declarations (EPDs).
- Strong understanding of methodological requirements, system boundary definition, allocation approaches, data quality assessment, and interpretation in accordance with ISO and EPD program operator rules.
- Specialized in greenhouse gas accounting (Scopes 1–3), life cycle-based decision support, and sustainability indicators, with a strong ability to ensure methodological consistency, transparency, and compliance with international standards and product category rules (PCRs).
- Proficient in ESG strategy development and integration, including materiality assessments, stakeholder engagement, and sustainability reporting across organizational levels.
- Experienced in circular economy implementation, including resource efficiency, waste reduction, product life extension, and closed-loop system design.
- Strong technical background in life cycle inventory (LCI) database development and management, with advanced proficiency in LCA software tools such as LCA for Experts (GaBi), SimaPro, OpenLCA, ecoinvent, and GREET.
- Proven track record in leading multidisciplinary projects, coordinating international collaborations, and advising stakeholders across industry, academia, and government.
- Recognized for rigorous, results-oriented leadership, strong analytical capabilities, and the ability to manage complex technical assessments with high attention to detail, key competencies for independent verification work.
- Extensive experience supervising and mentoring 15+ PhD and MSc students, and establishing long-term research partnerships with academic, industry, and government stakeholders.
- Extensive scientific and engineering background with 60+ peer-reviewed publications (Google Scholar citations: 4,100+).
- Skilled in proposal writing and grant acquisition for sustainability research, education, and applied projects. Adept at translating complex technical and scientific information into clear, structured, and audit-ready documentation aligned with regulatory and organizational requirements.
- Strong written and verbal communication skills, with proven ability to clearly present technical findings to expert and non-expert audiences in structured and defensible formats.
- Eligible for registration as a Professional Engineer (P.Eng.) with APEGA (under review).

EXPERIENCE

Research Engineer, November 2026 – To date

University of Alberta, Canada

- Support energy systems research projects through LCA, techno-economic analysis, and environmental modelling of low-carbon energy pathways, including biomass, hydrogen economy, and other emerging energy technologies and transition systems.
- Apply ISO 14040/44 standards to conduct LCA studies, ensuring methodological consistency, transparency, and high data quality.
- Develop and run GHG emissions and scenario models (Scopes 1–3) to evaluate decarbonization strategies, including renewable integration, hydrogen deployment, and bioenergy systems.
- Build and manage life cycle inventory databases to support robust energy systems modelling and research outputs.

- Contribute as an LCA expert in multidisciplinary academic–industry research collaborations, providing independent review and verification support, and producing technical reports, peer-reviewed publications, and funding proposals focused on energy transition and sustainability.

Senior Consultant, May 2022 – Aug 2025

Sphera Solution, QC, Canada

- Led ISO 14040/14044-compliant LCAs for 20+ products across sectors (construction, chemical, electronics, energy), delivering comparative studies for eco-design and automating models in LCA For Experts (formerly known as GaBi)
- Prepared and published verified EPDs (EN 15804, ISO 14025) across industries, managing third-party verification and supporting integration into LEED/BREEAM to boost compliance and product marketability.
- Conducted corporate-level footprinting (carbon, water, materials) and LCA-based hotspot analysis to guide impact reduction, support Science Based Targets, and advance circular economy and eco-design initiatives.
- Identified efficiency opportunities in energy, waste, and resources across operations and supply chains, resulting in cost savings and reduced impact.
- Enabled circular economy transitions and supported sustainable procurement through material analysis, eco-design, packaging optimization, and responsible sourcing.
- Advised clients on ESG integration and climate change risk management, aligning business practices with regulatory requirements and stakeholder expectations to enhance long-term resilience and sustainability performance.

Postdoctoral Researcher/Project Manager, Sep 2017 – May 2022

Department of Mechanical Engineering, University of Alberta

- Led the Life Cycle Assessment (LCA) research group in Energy and Environmental Systems Engineering, supervising PhD and MSc students across clean energy and sustainability projects
- Developed life cycle sustainability frameworks and conducted LCA and techno-economic assessments of renewable and non-renewable energy technologies
- Secured and managed national and international research grants, leading multi-stakeholder collaborations with academia, industry, and government
- Delivered key sustainability projects for major clients, including Suncor, PTTEP Canada, and Natural Resources Canada, focusing on hydrogen pathways, oil sands, and water use baselines
- Published multiple research papers and technical reports, and successfully mentored graduate students through thesis completion

Postdoctoral Fellow, Apr 2013 – Oct 2015

Institute of Molecular Sciences, University of Bordeaux, France

- Conceptualized and conducted research activities in the life cycle resource impact assessment and resource criticality assessment
- Developed a conceptual framework and new methods to integrate life cycle assessment and resource criticality assessment under the life cycle sustainability assessment framework
- Established research collaborative links with international research groups working in similar topics
- Advised and assisted PhD students
- Participated as a team member of LCM 2015 Conference—an international conference organized by the research group in collaboration with CIRAIG and [avnir]
- Wrote and published the main findings from the research in peer-reviewed international journals and books
- Presented the main findings in national and international conferences

Research and Teaching Assistant, Oct 2009 – May 2013

Department of Chemical Engineering - Universitat Rovira i Virgili, Spain

Assisted courses:

- Thermodynamics and Kinetics - for 2nd year Biotechnology students, 2009
- Elements of Control - for 4th year Industrial Engineering, specializing in Industrial Chemistry students, 2010
- Fundamentals of process engineering (Project coaching) - for 1st year Chemical Engineering student, 2010 – 2011, 2011 – 2012
- Laboratory of manufacturing processes - for 4th year Chemical Engineering students, 2011 – 2012

Assistant Lecturer, Sep 2005 – Sep 2007

Engineering Faculty of Bahir Dar University, Ethiopia

- Offered engineering courses to undergraduate students
- Prepared lecture materials and handouts
- Prepared examinations and evaluated students
- Advised graduating class students in their final year projects
- Advised students on course and academic matters

Technical and Vocational Education and Training Coordinator, 2006

Engineering Faculty of Bahir Dar University, Ethiopia

- Organized modules preparation for distance learning students
- Assigned lecturers, graduate assistants, and laboratory technicians for different courses
- Coordinated summer training and distance courses
- Prepared class and examination schedules

Graduate Assistant, 2003 – 2004

Engineering Faculty of Bahir Dar University, Ethiopia

- Assisted with courses and laboratory practical works
- Assisted exam preparation and correction
- Advised students

Other Experience:

Teaching Assistant, 2009 – 2013

Universitat Rovira i Virgili, Department of Chemical Engineering

Assistant lecturer, 2003 – 2007

Bahir Dar University, Engineering Faculty

Education:

Ph.D. in Chemical, Environmental and Process Engineering, 2013

Universitat Rovira i Virgili (URV), Spain

M.Sc. in Environmental Science and Management (Joint European M.Sc. in Environmental Studies) 2009

Technische Universität Hamburg-Harburg (TUHH), Germany; Universitat Autònoma de Barcelona (UAB), Spain; Aalborg Universitet, (AAU), Denmark; and Universidade de Aveiro (UA), Portugal

B.Sc. – Engineering, 2003

Bahir Dar University, Ethiopia

Skills and Abilities:

- Critical thinking and excellent communication skills in English, both oral and written
- Work well in a team environment: demonstrated through past working experience and post-secondary environment
- Excellent organization skills, punctual and excellent time management

- Strong problem-solving skills, great multitasking ability (editing and writing)
- Superior writing skills and proven experience as manuscript writer and editor (60+ high-impact peer-reviewed scientific publications)
- Enthusiastic, patient, responsible, goal-oriented, and able to think critically

Hobbies: Reading, biking, playing squash, and travelling