



James D. Stephen, Ph.D.

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KEY COMPETENCIES AND EXPERIENCE

- Seventeen years of experience managing bioenergy and waste consulting, research, and development projects
- Investment adviser to clean technology funds, multinational companies, project developers, and governments
- Completed over 65 consulting and project management contracts
- Significant experience designing decarbonisation strategies, projects, and policies for companies and governments
- Highly knowledgeable in the fields of bioenergy, biofuel, and biochemical feedstocks, logistics, and conversion technologies, in addition to climate change and alternative energy policy and investment prioritization
- MSc in Chemical & Biological Engineering and PhD in Forestry (bioenergy economics & financial risk)
- Strong publication record on energy policy and techno-economic assessment

CAREER HIGHLIGHTS

Managing Director and Founder, TorchLight Bioresources Inc.

2008-Present

TorchLight is a consulting and project management company focused on bioenergy, waste-to-energy, and bioproducts

- Investment adviser for >\$500 M in cleantech investments [*Emissions Reduction Alberta, Natural Resources Canada*]
- Project Manager/Lead for numerous consulting contracts, including:
 - Two projects on the role of bioenergy in Canada's economic growth & decarbonization to reach net zero [*NRCan*]
 - Canadian infrastructure investment needs to enable the use of solid biomass fuels [*Clean Fuel Committee/NRCan*]
 - Creation of low carbon pathways to 2030 to support development of Canada's Clean Fuel Standard [*NRCan*]
 - Resource and technology/company assessments to support development of the Clean Fuel Standard [*NRCan*]
 - Feasibility and techno-economic assessment of biojet production in Canada [*Air Canada and Airbus*]
 - Strategic assessment of company growth opportunities in biofuels and biomethane [*Greenfield Global*]
 - National county-level assessment of biomethane feedstocks, production costs, and interprovincial trade [*NRCan*]
 - Assessments of bioheat options for federal district energy systems [*Public Services & Procurement Canada*]
 - Comparative analysis of Canadian and EU biomethane (renewable natural gas) regulations [*NRCan*]
 - National stakeholder survey on renewable gas industry development [*Canadian Gas Association and NRCan*]
 - Techno-economic comparison of various bioethylene production options [*DuPont*]
 - Canadian market & individual project opportunity analyses for Nordic companies [*Business Finland, RI.SE*]
 - National market assessments of potential electricity generation and building heat wood pellet demand [*WPAC*]
 - \$25 M grant proposals for biomass co-firing project at a 450 MW coal GS (successful) [*Capital Power*]
 - Assessment of potential use of biomass in Canada's existing fossil fuel infrastructure [*Alberta Innovates*]
 - The role of bioenergy in Canada's energy and forest sector future [*Canadian Council of Forest Ministers*]
 - Three assessments of biomass use in the Canadian oil sands [*Canada's Oil Sands Innovation Alliance, NRCan*]
 - Assessment of biomass fuel switching opportunities in Alberta's industrial infrastructure [*Alberta Innovates*]
 - Strategy for repurposing waste facility infrastructure & assessment of waste-to-energy options [*City of Edmonton*]
 - Critical assessment of small-scale biomass combined heat & power technologies for remote communities [*NRCan*]
 - Development of a Bio Industry Development Roadmap for the Blue Sky Region of Ontario [*Ontario Government*]
 - Bioenergy opportunity analysis and industry development strategy for Brunei Darussalam [*Government of Brunei*]
 - Creation, population, and annual updating of the Canadian Bioheat Database (projects, developers) [*NRCan*]
 - Due diligence on the proposed \$80 M Whitesand First Nation biomass CHP and wood pellet plant [*IESO*]
 - Assessment of Labrador bioenergy development opportunities, including at remote communities [*NRCan*]
 - Assessment of bioheat/CHP options for Government of Canada buildings and military bases [*NRCan*]
 - Comparative assessment of district energy carbon intensities of various EU cities [*City of Vancouver*]
 - Assessment of industrial and community bioenergy options [*Regional District of Central Kootenay*]



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- Feasibility studies for biomass heat/CHP/district energy projects: community-wide arctic district energy system for Inuvik, NT [*Gwich'in Tribal Council*], remote community-wide district energy system in Bella Coola, BC [*Nuxalk First Nation*], district energy and bioheat in Anahim Lake, BC [*Ulkatcho First Nation*], municipal district energy system [*City of New Westminster*], waste-to-energy plant in Victoria, BC [*Westhills Land Corp.*], Haliburton Forest CHP & Haliburton Village DE (ON), & Northern Dancer Mine biopower [*Largo Resources Ltd.*]
 - District energy & urban biomass/waste CHP advocacy & concept development [*Fed, prov, & municipal gov'ts*]
 - Established and managed Canadian subsidiary of German solar company, including development of projects
 - Established P3 utility company with Municipality of Dysart et al. to develop & operate bioheat district energy system
 - Program Director of the BioCleantech Forum, an international conference held in Ottawa [*Alberta Innovates*]

Principal, JDS Biomass**2006-2009**

JDS Biomass was a sole proprietorship providing bioenergy consulting services

- Prepared network operating and investment strategy report for \$25 M British Columbia Bioenergy Network
- Designed, and prepared business plan for, a transportable wood pellet system for BC Innovation Council
- Consulted for the International Energy Agency (bioenergy) on biofuels technology development
- Conceived and authored successful \$300 k research grant application on wood pellets for ethanol production
- Authored feasibility study and business plan for small-scale biopower (750 kWe) for Haliburton Forest
- Authored network promotion document for BioEnergy Refining Innovations, a proposed interuniversity network
- Co-founded the West Coast Bioenergy Guild, a networking organization for bioenergy innovators

Manager, Biomass and Bioenergy Research Group, University of British Columbia**2006-2008**

BBRG is North America's leading wood pellet and biomass logistics research unit

- Developed and implemented successful plan to boost industrial partner support and doubled size of group to 30
- Managed & authored \$10 M ag bioenergy research network proposal including 25 partners
- Oversaw marketing program, including website and weekly seminar series of industry/policy speakers

Research and Communications Coordinator, BIOCAP Canada Foundation**2003-2006**

BIOCAP was a national research foundation creating partnerships between industry, government, and academia on bioenergy and climate change with board membership including Shell, Suncor, Dupont, Lafarge, TransCanada, TransAlta

- Managed \$4 M/yr in research and development projects, including securing industrial and government support
- Recommended investments in early-stage technologies and targeted research
- Lead negotiator for contracts and agreements, including consulting work and partnerships
- Project Manager for Canadian Bioenergy Dialogue that established a national industrial bioenergy strategy
- Managed Canadian Biodiesel and Pyrolysis Initiatives to establish national priorities for sector growth
- Managed Industrial Biomass Use in Ontario project: Assessment of biomass use by power, steel, & cement sectors
- Project Manager for Bioenergy and North Communities (BANC) initiative
- Representative at conferences and expert panels (e.g. UNFCCC COP-11, CSA Biofuels GHG Standard)

EDUCATION/ACCREDITATIONS

Doctor of Philosophy, *Viability of Transportation Biofuel Production from Forest Resources*
Faculty of Forestry, UBC, Vancouver, BC, Canada (NSERC & BCIC Scholarships)

2008-2013

Master of Science, *Biomass Supply Variability, Logistics, and Pricing Risk for Biorefineries*
Department of Chemical and Biological Engineering, UBC, Vancouver, BC, Canada

2006-2008

Bachelor of Science, *Life Science (Honours)*
Queen's University, Kingston, ON, Canada

1999-2003

Canadian Securities Course, Derivatives Fundamentals Course
Canadian Securities Institute

2004, 2009

CITIZENSHIP

Canada, United Kingdom
