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Sarah Marie Jordaan

# Wells to Wire

## Life Cycle Assessment of Natural Gas-Fired Electricity

- Contains clear examples that provide a greater understanding of techniques used to build relevant LCA models
- Prepares students and professionals for careers in the energy industry by introducing LCA and sectors related to the life cycle of gas-fired power
- Provides new research directions for specialized researchers in the field
- Supports more informed decision-making related to both energy and environmental policy

This book presents an unbiased, comprehensive examination of the state of knowledge for life cycle assessments (LCAs) of natural gas-fired electricity, covering a suite of environmental impact categories. An exploration of the life cycle environmental impacts of gas-fired electricity is used to introduce the field of LCA, advancements in methods and data, and the limitations thereof. Natural gas, particularly as a fuel for electricity generation, serves as a dichotomy within energy and environmental systems analysis. While the cleanest burning fossil fuel, it is not without impacts, making it an excellent case study for introducing life cycle assessment. This book introduces readers to the field of LCA using natural gas-fired electricity as a case study, as well as providing a comprehensive review of the state of the art in life cycle data, research, and scientific debate related to this product system. The author also elucidates data and methodological challenges inherent to the field of LCA, exemplified using published research. The text explores how to conduct LCA, describing the analysis from the perspective of a numerator and denominator. With each chapter, the complexity of undertaking a LCA of gas-fired power is unravelled beyond a simple fraction to the expansive network of infrastructure examined in this type of research. Students, instructors, LCA practitioners, and energy professionals will benefit from not only the introduction to data and methods, but also this useful summary of the state of the art in the field.

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