

Original article

The emergence of modern lighting in Canada: A preliminary reconnaissance



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ABSTRACT

Recent work in the international field of energy history emphasizes the diversity that defines industrialization around the world, and even within different energy sectors of the same country. Energy history is a newly emerging field in Canada, and one where recent preliminary research now makes it possible to venture into the area of comparative energy studies. This paper provides a preliminary reconnaissance of the emergence of modern lighting in Canada, situating its history within the country's larger idiosyncratic transition from the organic to the mineral energy regime. Canadians have always been among the world's highest energy consumers per capita, and they made a relatively late transition to the industrial regime. The country's cold environment, its dispersed settlement patterns, the persistence of a distinct rural political economy supported by an abundance of energy from the organic regime, as well as the absence of cheap coal in Central Canada, help to explain the country's distinctive characteristics. The history of lighting, however, is an exception within Canadian energy history: locally available, petroleum-based illuminating oil and stateowned hydroelectricity were adopted relatively early, comprising an exception within Canada's late-modernizing trend: lighting, and not heat or power, led the country's transition to the modern energy regime.

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1. Introduction

There is a growing international consensus that the shift from the organic or pre-industrial energy regime of wood, wind, water and muscle power to the mineral or industrial regime of coal, oil, natural gas and electricity was the necessary, if not sufficient, cause of industrialization and indeed "modernity" (Wrigley, 1988, 2010, 2016; Kander et al., 2014; Jones, 2010, 2014). Notwithstanding some considerable consistencies across societies as they industrialized in the nineteenth and twentieth centuries, including dramatic increases in energy consumption, economic growth, population and urbanization, historians generally agree that the process was discontinuous and varied. Not only did later-industrializing countries tend to make the transition at different rates and sequences than the norm suggested by western and northern experiences (Rubio and Folchi, 2012), but evidence suggests that industrialized countries themselves varied considerably across different energy services within their own national borders (Gales et al., 2007; Kander et al., 2014).

Energy history is a newly emerging field in Canada. While research is still a long way from providing the kinds of detailed

economic analysis of energy consumption and price provided by Fouquet (2008) for Great Britain and Kander et al. (2014) for Europe, recent pioneering research into Canadian energy consumption by Unger and Thistle (2013) in particular, has made it more possible to venture, albeit tentatively, into the area of comparative energy history.¹ This paper begins with a quick reconnaissance of Canada's industrializing energy transition, highlighting its unusually high levels of per capita energy consumption, and its relatively late transition from the organic to the mineral regime as compared to Britain and western Europe. It goes on to sketch out a preliminary history of lighting in Canada, arguing that modern lighting stands as an exception within Canada's more general late-modernizing trend: for lighting, and not heat or power, led the country's transition to the modern energy regime from the mid-nineteenth century. But Canadian trends differed from European here as well: citing other studies

¹ Richard Unger and John Thistle *Energy Consumption in Canada in the Nineteenth and Twentieth Centuries* (Consiglio Nazionale delle Ricerche—Istituto di Studi sulle Società del Mediterraneo, 2013)105, 77–78. The book provides for the first time statistical data on Canadian energy use in an international context. Their work follows energy related data explored by Davis (1957), Darmstadter et al. (1977) and Steward (1978). Another and non-statistical overview of Canada's distinctive energy history, see R.W. Sandwell, ed. *Powering Up Canada* (2016).

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documenting the early dominance of hydro-electricity in Canadian cities, the paper presents new evidence on the country's relatively limited reliance on gaslight and heavy reliance on illuminating oil – kerosene – that defined the country's first step towards the mineral regime.

2. Canada's energy landscape

The industrialization and urbanization of Canadian society in the 1880–1920 period is a commonplace of Canadian history. As Fig. 1 suggests, Canada witnessed the massive increase in energy consumption characteristic of industrializing countries. While evidence abounds that Canada “enjoyed a pace in economic activity from 1870 to 1914 that was among if not the highest in the world” (Unger and Thistle, 2013; 83), the country had some distinctive patterns of energy use during its early industrial development. Canadians have long been among the highest per capita energy users in the world (Fig. 2). In 1800, pre-industrial Canadians were consuming more than six times as much energy as Europeans per capita, and almost three times as much as the English. After briefly losing its ‘lead’ to England in the late nineteenth and early twentieth century decades, by the 1920s Canadians had regained it over the English and Europeans, and notwithstanding considerable gains in per capita energy consumption across Europe in the post-war years (Unger and Thistle, 2013; Kander et al., 2014). Historians look to the country's long, cold winters, extremely low population densities, the vast distances separating people from each other and from markets, and the energy-hungry resource-based economy to explain such high per capita energy use.

But if Canadians consumed at least twice as much energy per capita as Europeans throughout most of the nineteenth and twentieth centuries, they were considerably later in making the shift from the organic to the mineral regime (Fig. 3). The superabundant supplies of biomass fuel (wood) and water to transport it help to explain why it was not until 1906 that Canadians obtained more energy from fossil fuels than from the

organic regime, a benchmark that England and Wales had reached by 1800, and the United States by the 1880s. It was not until 1955 that Canada reached the 90 per cent level of modern versus traditional energy use that Britain had attained by 1845 (Unger and Thistle, 2013; 77; MacFadyen, 2016; Warde, 2006). I have argued elsewhere (Sandwell, 2016b) that the little-acknowledged persistence of Canada's distinctive rural political economy was another factor influencing the country's late transition to fossil fuels. While a majority of Canadians were indeed designated as urban for the first time in 1921, the fact that the definition of “urban” bore no relation to community size before 1951 resulted in some statistical anomalies. It was not until 1941 that for the first time a scant majority of Canadians were living in urban communities with a population larger than 1000, and it was not until 1961 that most Canadians were living in communities with populations larger than 5000 (Sandwell, 2013). The rural land-owning majority continued to rely heavily on their direct and “free” access to much of the food and fuel energies they needed from the organic regime well into the twentieth century. Most rural families in the 1890–1950 period and beyond relied not only on self-provisioning and the sale of agricultural commodities, but on a third pillar of economic support, and one that linked their local environments to the global industrializing economy: seasonal and intermittent waged work in the nascent resource industries, transportation networks and energy infrastructure projects that were turning Canada into a resource-rich nation in the early twentieth century. For about half a century, the muscle-power of this rural reserve army of labour and their draught animals not only helped the remuneration for the typically cash-strapped farmers, but fueled Canada's early integration into the global industrial economy. Canadians were still getting more energy from wood than oil on the eve of the Second World War (Unger and Thistle, 2013).

Another factor further distinguishing Canada's industrialization from that of Britain and much of Europe deserves mention here: the limited role that coal played. As Fig. 3 illustrates, coal has never provided more than two thirds of the country's energy. The dominance it achieved over wood in 1906 was, as in much of

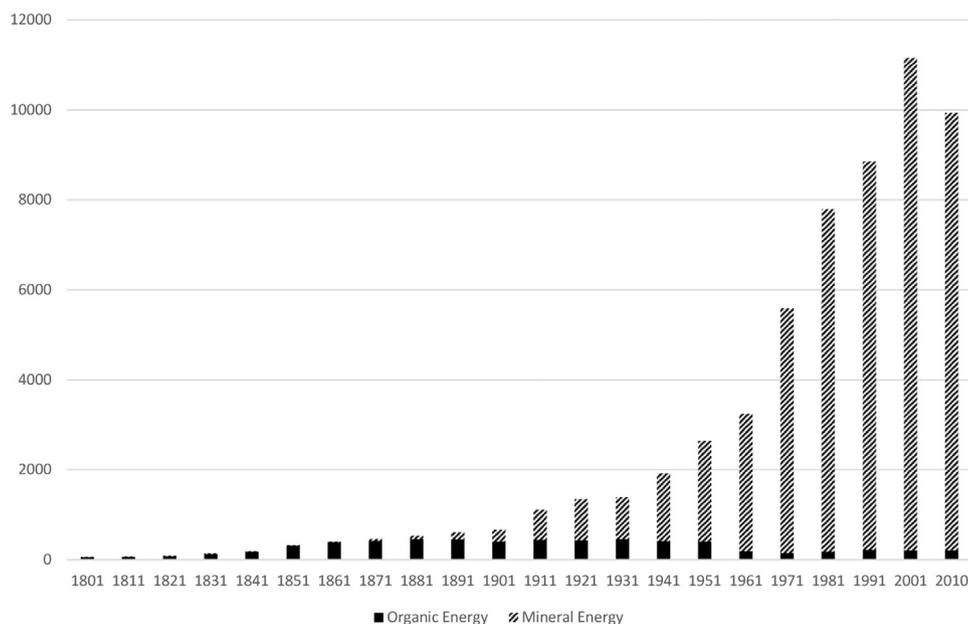


Fig. 1. Organic and mineral energy consumption in Canada, selected dates 1800–2010 (petajoules).

Source: Unger, Richard and John Thistle, 2013, *Energy Consumption in Canada in the Nineteenth and Twentieth Centuries* (Consiglio Nazionale delle Ricerche - Istituto di Studi sulle Società del Mediterraneo), Appendix 1.

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