

Competing Policy Paradigms and the Search for Sustainability in Ontario Electricity Policy

Mark Winfield and Becky MacWhirter

The design and role of Ontario's electricity system have been central elements of debates about the province's economy and environment since the system's origins at the beginning of the twentieth century.¹ Although electricity accounts for only one-fifth of the province's total energy consumption, questions around the generation, distribution and conservation of electrical energy dominate Ontario's energy policy discourse (Joshi 2012). The scale of Ontario's electricity system is substantial. The province has planned expenditures in the range of \$87 billion over the next twenty-five years on its maintenance and expansion (Ministry of Energy 2010), a level of investment comparable to what has been anticipated in the development of Alberta's oil sands.² The consequences of the decisions made about the Ontario system's direction are of no less economic, social and environmental importance to Canada's future.

For the first seventy years of their existence, the institutions and policies that defined the province's electricity system operated in an environment of relative stability. In contrast, the past three decades have been characterized by growing policy instability. Since the late 1970s, Ontario has moved through a succession of apparently contradictory policy models: supply planning; "soft" energy paths and integrated resource planning; a "market" model; a "hybrid" model combining market and planning elements; a renewable energy paradigm centred around the 2009 *Green Energy and Green Economy Act* (GEGEA); and most recently an *ad hoc* approach driven by political management considerations. The consequences of the latter model played no small role in Premier Dalton McGuinty's October 2012 announcement of his resignation (Howlett, Morrow, and Waldie 2012). Despite this outcome, the *ad hoc* political

management paradigm was continued and eventually formalized through legislation by the government of McGuinty's successor, Kathleen Wynne. The long-term implications of this approach are uncertain, but seem unlikely to serve the goals of advancing either policy stability or sustainability.

In a political economy context, the primary focus of discussions of energy policy has been on the tensions between the liberal and particularly neoliberal emphasis on markets as the most efficient mechanism for making decisions about developing energy resources and, alternatively, state-centred approaches, which stress the importance of democratic control over energy policy. Progressive students of energy policy in contrast, generally following the pioneering work of Amory Lovins (1980), have emphasized the importance of the technical and planning paradigms around which energy systems have been designed as being more central to understanding energy policy decisions. These approaches are grounded in the observation that both publicly and privately owned and controlled energy utilities have suffered from the same "hard" path pathologies of massively overbuilding large, capital intensive, inflexible, high environmental impact, high catastrophic event risk energy supply technologies (e.g. nuclear and coal), and underemphasizing the "soft" path options of energy efficiency and smaller, more flexible low-impact renewable energy sources. Authors working on energy-related questions within political economy frameworks have tended to highlight the centrality of the specific material character of energy resources (e.g. their particular physical properties and nature of the technologies and infrastructure required for their use) to the understanding of governance and public policy issues around them (Mitchell 2011).

The underlying normative framework for the chapter considers how the Ontario electricity system can be configured to advance sustainability and system stability. Sustainability

is defined here as incorporating the core Brundtland (WCED 1987) elements of both *intergenerational* and *intragenerational* justice. The chapter also draws on more recent reflections on sustainability (Gibson 2006) and works specific to energy issues (Jaccard 2005; Winfield, Gibson, Markvart, Gaudreau, and Taylor 2010; Winfield 2016). These contributions incorporate considerations regarding the importance of system resilience, adaptive capacity, and the avoidance of path dependency; precaution, particularly with respect to the potential for catastrophic events; the need for economic and resource efficiency; the centrality of socio-ecological civility and democratic governance; and the avoidance of geopolitical risks in energy system design. Such a framework leans towards the soft path technological options, but also highlights the importance of the role of the state in system planning to ensure democratic governance.

Within these theoretical contexts, the following chapter argues that the present electricity policy situation in Ontario reflects the extent to which the long-standing historical consensus around the objectives of the province's electricity system of providing cheap and abundant electricity, and the planning models used to support those objectives, has broken down. New actors, including organized environmental interests and, more recently, an emergent renewable energy industry, have challenged the system's traditional assumptions and directions in terms of their environmental and social consequences, ability to deliver electricity reliably and at least cost, and to adapt and respond appropriately to the rapid changes occurring in the province's economy and society. The result has been a highly unstable policy environment in which different constituencies, or "policy entrepreneurs" have been able to take advantage of the "policy windows" (Kingdon 1995) created by convergences of problems and crises, political

circumstances and the availability of new policy ideas, to take control of the electricity policy agenda – until the arrival of the next window.

In this environment, decision-making around electricity became explicitly politicized to an extraordinary degree during the latter stages of the McGuinty government, a practice continued and formalized under his successor, Kathleen Wynne. The resulting policy environment has come to be defined by a combination of low legitimacy and high instability. The province's future premiers face decisions about the overall design and course of the province's electricity system in the face of uncertainty about the future direction of electricity demand. A series of emerging socio-technological revolutions in the energy sector, including the rapid deployments of "smart" grids, and dramatic improvements in the technological performance of renewable energy and energy storage technologies further complicate the landscape (Winfield 2017). These are questions that will require far more than day-to-day political management to resolve.

In attempting to understand the origins of the province's current situation, the chapter pays particular attention to the competing policy and governance paradigms (Skogstad 2008) for the electricity system being advanced by different actors. The importance of the role of underlying normative concepts and factors in understanding public policy, particularly energy policy, has been highlighted by a number of authors (Doern and Toner 1985; Doern and Gattinger 2003; Dryzek 2005; Winfield and Dolter 2014). There has been a tendency in the mainstream Canadian public policy literature to address these questions through proxies of state and non-state actors rather than treating them as important variables in their own right. As such the chapter explores the six policy paradigms that have defined the system from its origins in 1906 under the auspices of Sir Adam Beck's Ontario Hydro-Electric Power Commission

(HEPC), in terms of their normative assumptions, the institutional and societal actors that supported them, and the circumstances which led to their demise and the emergence of new paradigms.

Paradigm 1: Supply Planning

A supply planning paradigm guided Ontario's electricity system over the first seventy years following the creation of the Ontario Hydro-Electric Power Commission (HEPC) by the Conservative government of James Whitney in 1906. The supply planning model sought to expand electricity capacity to meet projected demand growth by way of centralized, large-scale generation facilities whose economies of scale yielded lower electricity rates (Swisher, Jannuzzi, and Redlinger 1997). Supply planning typically led to monopoly system structures, rapid capacity expansions in the form of capital-intensive energy mega-projects, hierarchical transmission and distribution systems, the active encouragement of electricity consumption as it was believed to be essential to economic growth, and political interventions to keep rates low. In Ontario, the HEPC and its successor, Ontario Hydro, are widely regarded to have been archetypical supply planning entities – monopolies responsible for planning, building and operating the electricity generation and transmission system. The model defined the role and approach of most publicly and privately owned utilities in North America until the 1980s.

Anticipating ever-increasing demand for electric power, the HEPC set out in the 1920s to develop or purchase all of the viable hydroelectric sites available in Ontario. The exhaustion of accessible and economic hydraulic sites, coupled with increasing post-World War II electricity demand, led to the addition of coal-fired generation from the early 1950s onwards (Macdonald et al. 1996). The availability of uranium deposits in Northern Ontario prompted recommendations

that in the longer-term, large-scale nuclear power plants provide the foundation of both new supply and the development of an export-oriented nuclear industry in the province. By the late 1960s the province's first nuclear generating station (Douglas Point) was online, another (Pickering) was under construction, and plans for further stations announced (Freeman 1996, 126).

Private industry played a major role in sustaining the supply planning model in Ontario. Major industrial energy consumers supported the supply planning model believing that its "economies of scale" approach provided cheap, abundant and reliable supplies of energy. The interests of three primary actors were supported by this governing paradigm, namely the HEPC and its successor (Ontario Hydro), industrial energy consumers, and the Conservative/Progressive Conservative "dynasty" that dominated the province's politics for most of the twentieth century (Swift and Stewart 2004, 14).

Paradigm 2: Supply Planning Meets Soft Energy Paths – Integrated Resource Planning

Debates began to emerge throughout North America over the prudence of the supply planning policy paradigm from the mid-1970s onwards. These arguments were driven by a combination of concerns over the widespread and massive cost-overruns on the utility-sponsored nuclear projects that the model had spawned, the environmental impacts of coal-fired electricity, energy security concerns resulting from the 'oil shocks' of the mid-1970s and the safety implications of the 1978 Three Mile Island nuclear accident (Swift and Stewart 2004, 3). The central figure in the emerging critique was Amory Lovins, an energy researcher trained in physics. Lovins (1980, 176, 191) challenged the supply planning based "hard" energy path and its emphasis on large-scale centralized technologies on the basis that:

- It is inflexible and results in path dependency limiting the ability of future decision-makers to adopt new and superior technologies;
- It is inefficient and costly due to its capital-intensive nature and its tendency to overbuild supply; and
- The scale and complexity of hard path infrastructure subjects the system to greater risk of malfunction and disruption.

Lovins argued instead for an approach based on “soft” technologies such as energy efficiency and renewable energy. The principles of the soft path paradigm were as follows:

- Perpetual growth in electricity demand is not necessary for economic prosperity;
- The environment is a finite system – the environment has limits;
- Distributed generation is preferable to centralized control;
- The electricity system should be flexible, diverse, sustainable and benign;
- Conservation and efficiency should be pursued first, renewables second;
- Energy supply should be matched to end-use needs in terms of scale and quality;
- There must be opportunities for broad participation in the energy system; and
- Low impact fossil-fuel technologies (e.g. natural gas) should be used to enable the phase-out of nuclear and other “hard” path technologies.

Lovins’ critics, particularly established actors in the energy sector, viewed his ideas as unnecessary, infeasible and even dangerous (Robinson 1982, 27). To others, however, they represented an alternative policy paradigm - one that, to this day, continues to provide much of the intellectual foundation of critiques of conventional approaches to energy system planning and technological choices. In Ontario, criticism of the supply planning model and Ontario Hydro’s expansionary aspirations had begun to emerge even before Lovins’ articulation of the soft path

concept. A diverse and fragmented group of anti-nuclear advocates, environmental organizations, opposition party politicians and energy experts had already started to argue that Ontario Hydro was grossly overestimating future electricity demand, hiding the true costs of nuclear projects, ignoring the potential for improvements in energy efficiency and the emergence of new renewable energy technologies (Swift and Stewart 2004).

In response to the emerging public concerns over Ontario Hydro's approach and activities, a Royal Commission on Electric Power Planning, chaired by Arthur Porter, was established by the Davis government in 1975. The Porter Commission was mandated to investigate Hydro's demand forecasts and nuclear program. The Commission's 1980 final report challenged the soundness of Ontario Hydro's planning assumptions and recommended that "the rigidity of supply planning, with its fixation on large-scale nuclear plants, be abandoned for the flexibility of demand management and smaller-scale additions to generation capacity" (Swift and Stewart 2004, 28). The government nominally accepted the bulk of the Commission's recommendations, and Ontario Hydro initiated some energy conservation programs, but the focus on the development of major nuclear energy projects, particularly the Darlington facility east of Toronto, continued (Winfield 2012, 34).

The fall of the Progressive Conservative "dynasty" after the 1985 provincial election and its replacement by a minority Liberal government, led by David Peterson, seemed to reinforce the shift in a softer path direction. Neither partner in the Liberal-NDP accord that brought Peterson to power was politically committed to nuclear energy; indeed both parties had been regular critics of Ontario Hydro's approach to electricity matters during the Davis period. The 1986 final report from the Legislature's Select Committee on Energy, established under the auspices of the accord and delivered in the aftermath of the Chernobyl nuclear accident, echoed

many of the Porter Commission's conclusions, further legitimizing the soft path option. The committee found that Ontario Hydro's nuclear expansion plans impeded conservation efforts and recommended a focus on small-scale generation and investments in energy efficiency (Swift and Stewart 2004, 54-56).

Despite concerns over the extent of the cost overruns on the Darlington project, the Peterson government ultimately authorized its completion, but also pressed Ontario Hydro to move in the direction of more integrated resource planning (IRP) that considered the supply *and* demand sides of the province's electricity needs while adding conservation and renewable energy sources to its list of more traditional options. The resulting 1989 Ontario Hydro Demand Supply Plan (DSP) seemed to reflect some of these directions, incorporating extensive conservation programs and environmental analyses of the options it proposed. But the plan also still strongly reflected Ontario Hydro's supply planning heritage - based on assumptions that economic growth required increasing amounts of electric power and calling for the construction of new nuclear and natural gas-fired generating facilities (Winfield 2012, 59).

Bob Rae's NDP government, which succeeded the Peterson Liberals in 1990, seemed poised to move even more substantially in a soft path direction, with strong policy commitments to energy efficiency in its platform, and the announcement of a moratorium on future nuclear construction in its initial Speech from the Throne. These directions would, however, be overtaken by a series of new crises involving the electricity file. The recession of the early 1990s resulted in declining, rather than growing, electricity demand, first leading to the deferral of any new generating projects and then the withdrawal of the 1989 DSP. Dramatic increases in electricity rates, excessive generating capacity in the context of declining demand as the Darlington facility came into service, and a \$26 billion debt largely arising from Darlington and

the earlier Pickering and Bruce nuclear projects, led Ontario Hydro's incoming Chairman, Maurice Strong (1992-95), to declare the utility a "corporation in crisis" (Ontario Power Generation Review Committee 2004). Plans for both nuclear construction and energy efficiency programs were abandoned as the corporation's staff was reduced by 30 per cent (Winfield 2012, 75).

The effort to create an Integrated Resource Planning model by injecting the supply planning model with softer path elements effectively had collapsed. The province found itself in a vacuum with respect to the direction of electricity policy and with a provincial utility whose credibility as the planner, builder and manager of Ontario's electricity system was seriously damaged (Daniels and Trebilcock 1996, 63).

Paradigm 3: Deregulation and Competitive Markets

The "Common Sense Revolution" platform that helped carry Mike Harris' Progressive Conservatives to victory in the 1995 provincial election said little about electricity policy beyond the promise of a five-year rate freeze. In practice however, the Harris government, propelled by the combination of the ongoing collapse in confidence in Ontario Hydro, its own strong neoliberal ideological orientation, and the influence of market-based policy models being adopted in the United Kingdom and the United States in response to failures of supply planning models in those jurisdictions, embarked upon the most significant restructuring of the province's electricity system ever undertaken to that point.

An Advisory Committee on Competition in Ontario's Electricity System was quickly established to outline future directions for the electricity system. The Committee's recommendations sought to transition the electricity system from a publicly-owned monopoly to

a competitive system controlled and administered by a mix of private and public enterprise (Macdonald et al. 1996, 27). The system planning functions of Ontario Hydro would be eliminated. Instead, private investors would make decisions about investment in new generating capacity, acting in response to the potential returns on investment that would flow from meeting anticipated future demand. In theory this would avoid the problem of the massive over-construction of generating assets that had led Ontario Hydro and many US utilities into financial crisis.

Rather than having prices set by Ontario Hydro or a utility regulator, the consumer price of electricity would be determined by the wholesale market, into which any qualified generator could sell power. As a result, electricity consumers would face a rate system characterized by far greater price fluctuations and potential for price increases in response to high demand than the previous model. Ontario Hydro itself would be broken up, and the portion of the electricity market controlled by its successor companies reduced (Macdonald et al. 1996, 26, 33, 34).

The market-based model was to be implemented through the 1998 *Energy Competition Act*. The Ontario Energy Board (OEB) was given an expanded mandate to regulate the wholesale and retail electricity markets and an Independent Market Operator (IMO) (later renamed the Independent Electricity System Operator (IESO)) was created to manage the day-to-day operation of the electricity market. Ontario Hydro itself was split into a series of provincially-owned entities: Ontario Power Generation (OPG) assumed control of Ontario Hydro's generating assets; Hydro One took responsibility for the management and operation of the transmission and rural distribution network; and the Ontario Electricity Financial Corporation (OEFC) absorbed \$22 billion of Ontario Hydro's 'stranded' debt, effectively transferring it from the successor

corporations to the provincial government.³ An Electrical Safety Authority took over Ontario Hydro's electrical safety regulation functions.

The drive towards markets was not based on widespread public support. In fact, the constituency for the market model was relatively narrow: academic economists; large industrial power users represented by the Association of Major Power Consumers of Ontario (AMPCO); the market-oriented non-governmental organization (NGO) Energy Probe; potential builders of new generating facilities; and investment dealers hoping to profit from the anticipated privatization of OPG's fossil-fuel and hydro-electric assets and Hydro One (Swift and Stewart 2004, 120, 147, 154).

The government's initial plan was for competitive electricity markets to open within two years of the adoption of the *Energy Competition Act*. In practice the process of introducing markets proved much more complex than suggested by the elegant neo-classical economic theories that had underlain the Macdonald and subsequent market design committee reports. The implementation of competitive markets required the development of major new capacities and regulatory frameworks on the part of the OEB, IESO and local electricity distribution companies.

In the meantime, seven of the province's twenty nuclear power reactors had to be taken out of service in 1997 as a result of serious concerns over maintenance and operating practices under the auspices of a Nuclear Asset Optimization Plan (NAOP). The missing power was made up through dramatic increases in generation from OPG's coal-fired plants. The resulting growth in air pollution and greenhouse gas (GHG) emissions made the plants the target of high-profile campaigns. Environmental and public health organizations, led by the newly established Ontario Clean Air Alliance and including the Ontario Medical Association, advocated the plants' closure, rather than sale to private operators. The repair and refurbishment of the out of service reactors at

the Pickering and Bruce facilities was itself subject to major delays and cost-overruns (Winfield 2012, 140). The government's attempt to privatize Hydro One was blocked by a court challenge led by the Canadian Union of Public Employees and the Communications, Energy and Paperworkers Union (Gans 2002).

Competitive wholesale and retail electricity markets did eventually open in Ontario on May 1, 2002, nearly two years behind the government's original schedule. Complications began to arise almost immediately. The summer of 2002 was exceptionally hot, with the result that electricity demand, driven by air conditioning loads, reached record highs. The retail and wholesale markets reacted to this situation precisely as they had been designed, pushing consumer electricity costs upwards. The public, which had been repeatedly assured by Premier Harris and Minister of Energy, Science and Technology Jim Wilson that markets would "help keep [electricity] prices low" (Benzie 2001) reacted angrily. The government responded with a major retreat from the market model, terminating the competitive retail electricity market in November 2002 and fixing the consumer electricity price at 4.3 cents per kWh for the next six years, retroactive to May 1, 2002. Picking up on themes raised in the June 2002 report of the Legislature's Select Committee on Alternative Fuels (Galt 2002), a number of modest initiatives related to energy conservation and renewable energy, options that had been almost completely ignored in the design of competitive markets, were announced at the same time.

Adding to the government's problems were growing concerns, particularly among major industrial electricity consumers, about the security of the province's long-term electricity supply. Industrial consumers, who had originally been strong supporters of the move to competitive markets, now began to question the model's ability to ensure that future demand would be met through private investments in new generating capacity, particularly as the bulk of the province's

coal-fired and nuclear power plants would reach the end of their normal operational lives over the coming twenty years. In response, an Electricity Conservation and Supply Task force was established by the government in June 2003 with a mandate to develop a plan for attracting new generation, promoting conservation, and enhancing system reliability. The task force's creation signaled a further potential retreat from the market paradigm.

The concerns about security of supply and the government's management of the system were dramatically reinforced by the August 2003 blackout that affected Eastern North America. The episode highlighted questions about the ability of the electricity transmission system to cope with the stresses being placed on it by the introduction of competitive electricity markets throughout North America.

The Harris government's response to the apparent failure of the supply and integrated resource planning paradigms and resulting financial and operational crises at Ontario Hydro was a dramatic move in the direction of a competitive electricity market. When that model began to collapse in the face of a host of practical and political challenges the government of Harris' successor, Ernie Eves, responded with a series of *ad hoc* measures: the termination of the retail electricity market; the implementation of a consumer rate freeze; a very modest reengagement with the soft path options of conservation and renewables; a retreat from the privatization of Ontario Hydro's successor companies and assets; and perhaps most importantly the establishment of the Electricity Conservation and Supply Task Force. But by the time of the October 2003 election, no coherent vision for the way forward with the electricity system had emerged.

Paradigm 4: The Planning/Market Hybrid

The Conservatives' misadventures with the electricity file perhaps did as much as the Walkerton water disaster (O'Connor 2002) to undermine their reputation for administrative competence, and played no small role in their defeat in the 2003 provincial election. The province's new Liberal government, led by Dalton McGuinty, arrived with a commitment, driven by concerns over the air quality impacts of the post-1997 NAOP expansion of coal-fired generation, to phase out coal-fired electricity by 2007. But they had little else in terms of a sense of the way forward on the electricity file. The new government was ideologically neutral with respect to the electricity system, but had built strong alliances while in opposition with the environmental and public health critics of the market model adopted by the previous government. In practice the McGuinty government would find itself compelled to invent a new policy paradigm combining planning and market elements as it responded to a new succession of crises, both perceived and real.

The origins of this new "hybrid" paradigm lay in the work of the Electricity Conservation and Supply Task Force – the body established by the previous government to review the electricity system in the face of the effective collapse of the market experiment. The task force delivered its report in January 2004, warning that electricity demand in the province would continue to grow and that an "electricity supply shortfall" was looming in Ontario as a result of the Premier's commitment to a coal phase-out and the anticipated end of life of the nuclear facilities. The task force, whose members were primarily large industrial power consumers, effectively recommended a return to long-term planning, to be led by the IMO. But they also concluded that "private investment and risk taking.... be the mainstay of the future power system, following competitive principles" (Electricity Conservation and Supply Task Force 2004).

In response to the Task Force's recommendations, an *Electricity Restructuring Act* was adopted at the end of 2004. The Act's central feature was to create the Ontario Power Authority (OPA) to conduct long-term planning for electricity generation, demand management, conservation and transmission and to develop an integrated power system plan (IPSP) for Ontario. At the same time the OPA was also mandated to facilitate a long-term transition towards a market-based model. As an interim measure until the IPSP was developed by the OPA and approved by the OEB, the Act permitted the Minister of Energy to issue "directives" to the OPA and other agencies regarding the development of new generation and conservation resources.

The OPA's planning mandate was first put into practice in May 2005, when the Minister of Energy sent a request to the OPA for advice on options for an appropriate supply mix for Ontario's future electricity system. This would then provide the basis for the Minister's Supply Mix Directive to the Authority. The Directive, issued to the OPA on June 13, 2006, took the unusual approach of specifying targets for individual technologies within the plan as opposed to setting high-level policy objectives under which the OPA could formulate a plan and the OEB review it. While identifying minimum targets for conservation and demand management (CDM) activities and new renewable energy supplies, the directive made it clear that nuclear power would remain the foundation of the province's electricity system, calling for 14,000 MW of nuclear generating capacity – a target which would require refurbishing existing nuclear plants and building new reactors. The directive also required that the OPA plan for the phase-out of coal-fired generating facilities "as early as possible" – a retreat from the original 2007 phase-out target (Duncan, 2006). Breaking with the precedent established during the handling of the 1989 Ontario Hydro DSP, the IPSP was exempted from review under Ontario's *Environmental*

Assessment Act. Rather the OPA was required to demonstrate that it had “considered” environmental sustainability in developing the plan (Winfield 2016).

The McGuinty government would never issue a white paper or any other document explaining how the new model was to actually function. In practice, the model evolved in a direction where the OPA undertook planning activities in response to the minister’s directives, determined the need for new resources, and then contracted the construction of new supply from the private sector. Such contracts were sometimes established on a competitive bid/request for proposal (RFP) basis, although sole-source contracts were employed with respect to the nuclear refurbishment projects at the Bruce and Pickering facilities with Bruce Power and OPG respectively.⁴ In an atmosphere of near panic about the future of the province’s electricity supply the contracts for new supply typically guaranteed both minimum prices and minimum revenues for project developers, regardless of whether the facilities were actually required to generate power, or the power could be used by the electricity system. The potential for new generation to be developed on a market basis by private developers without contracts with the OPA, as envisioned in the original market model, virtually disappeared as the OPA contracted new nuclear, natural gas and renewable energy projects. The latter types of projects were acquired through both RFPs and a small Feed-in-Tariff (FIT) program for projects under 10MW, initiated in 2006. Although with the entry of new private and community-based sources of generation and the eventual phase-out of OPG’s coal-fire plants, OPG’s portion of total generation fell relative to that of Ontario Hydro (85 per cent as of 1997), the provincially owned company’s assets still dominated the system, providing approximately 62 per cent of total output in 2016 (OPG 2016; IESO 2017).

With the OPA's submission of the first IPSP to the Ontario Energy Board (OEB) in August 2007 (OPA 2007), the re-election of the McGuinty government a few months later and the initiation of OEB hearings on the plan in September 2008, it looked as if some form of closure was at hand with respect to the future direction of the province's electricity system. In practice it would prove to be anything but. A host of unresolved issues around the province's direction, in combination with radically changed economic circumstances, would provide the opportunity for the emergence of another new policy paradigm.

Paradigm 5: The Renewable Energy Economy

The OPA's Supply Mix Advice and the government's Supply Mix Directive regarding the IPSP had been the target of extensive criticism from NGOs following the electricity file. Greenpeace Canada, the Pembina Institute, the Ontario Clean Air Alliance and WWF-Canada found that the product of the hybrid model looked suspiciously like the outputs of the old supply planning model. It emphasized hard path supply options, particularly the central role of nuclear power, was grounded on ambitious projections of growing electricity demand, and seemed hostile to larger roles for conservation and renewables (Gibbons 2008).

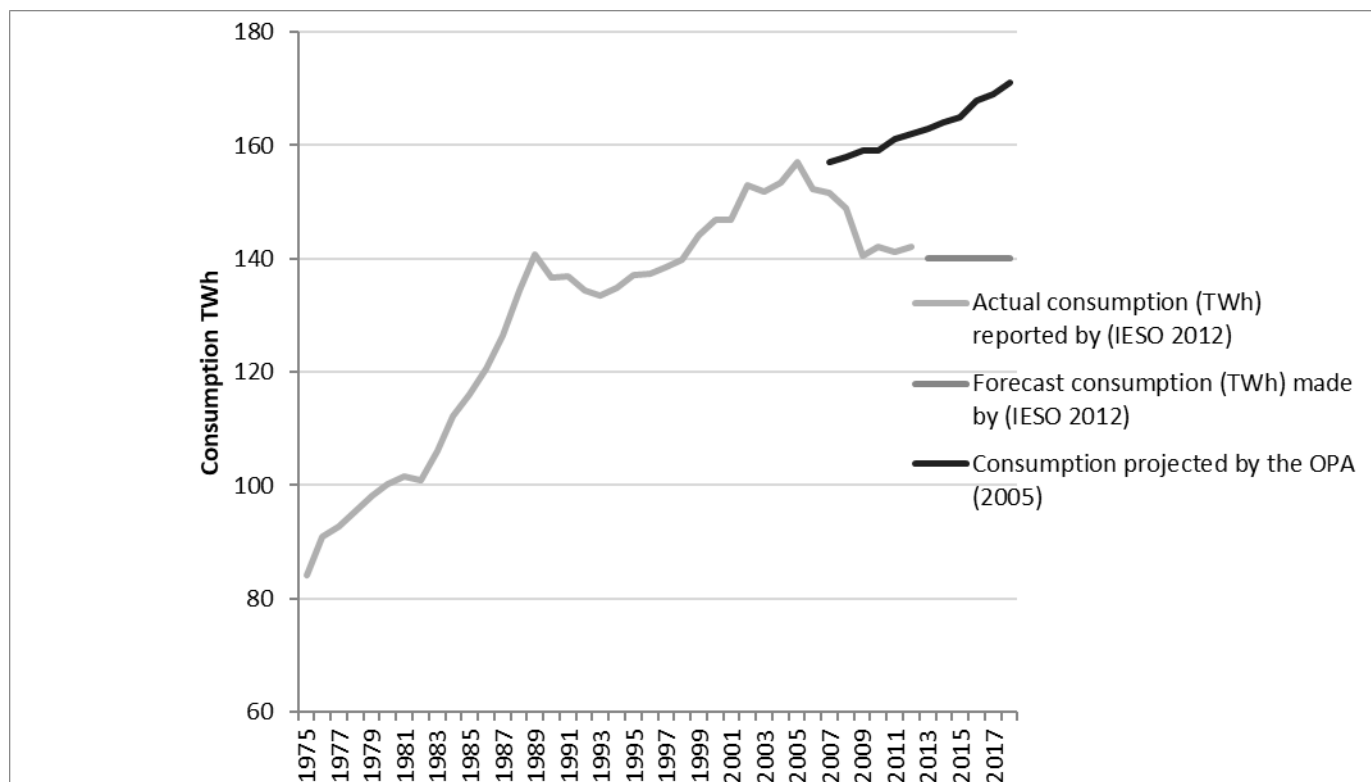
These criticisms, which had been pointedly ignored by the OPA, would find an apparently more receptive ear in the new energy minister, George Smitherman, who was appointed after the 2007 election. A few weeks into the OEB's hearings on the IPSP, Smitherman directed the OPA to revise the plan to incorporate more ambitious targets for renewable energy sources and conservation, compelling the authority to withdraw the plan while it was redrafted. While the new directive seemed to signal a greater emphasis on the role of 'softer' energy sources and technologies in the displacement of coal power, the Minister also

reiterated the province's commitment to a nuclear capacity goal of 14,000MW and the continuation of its new build nuclear procurement process (Smitherman 2008).

At the same time, Smitherman began to be exposed to new policy ideas regarding the potential for the rapid expansion of renewable energy sources, particularly wind and solar photovoltaic energy, in Ontario. The adoption of feed-in-tariff programs in Germany, Spain and Denmark for these technologies had produced dramatic growth in their deployment in Europe (Hamilton 2008b). These programs paid renewable energy developers a guaranteed price for any energy they produced, and assured them access to the electricity grid. The strong commitments of the incoming Obama administration in the United States on renewable energy and energy conservation (Weiss 2010), and growing state-level activity around these options (Rabe 2010) further reinforced the province's interest in the potential expansion of their roles in Ontario (Winfield 2015). A coalition of environmental, agricultural, aboriginal and renewable energy interests had already come together over the summer of 2008 under the banner of the Green Energy Act Alliance to begin lobbying for a "Green Energy Act" establishing a large/utility scale European-style FIT program in Ontario (Hamilton 2008).

The final element in the downfall of the original IPSP and the emergence of a new policy paradigm defined by green energy was the fall 2008 global economic downturn. Contrary to the OPA's projections, as shown in Figure 2, electricity demand in Ontario had already begun to decline rather than grow from 2005 onwards, a trend that was accelerated by the 2008 crisis. The impact of this downward trend affected the province's manufacturing sector particularly strongly (Ministry of Finance 2010). The downturn had the twin effects of further undermining the assumptions behind the IPSP regarding the growth in electricity demand, and creating demand for a provincial economic recovery plan.

Figure 1: Ontario Electricity Consumption in terawatt hours/year (tWh/yr)



Source: Actual 1975-2012 and Forecast 2013-2018 (OPA 2007 and IESO, 2012)

In this context, the Green Energy Act Alliance demonstrated some extremely deft policy entrepreneurship and positioned its proposed green energy legislation as an economic development strategy. A rapidly expanding renewable energy industry would offer support for renewable energy development in aboriginal and rural communities, and also provide the basis for the emergence of a new green energy technology manufacturing and services sector similar to that which had developed in Germany and Denmark in response to their FIT programs. Within this ecological modernist (Dryzek 2005) vision, green industry would become a driving force of Ontario's future economy (Green Energy Act Alliance 2008). The government itself repeatedly highlighted the potential for a green energy strategy to produce 50,000 jobs in Ontario (Ministry

of Energy 2011b). Domestic content requirements regarding the sourcing of renewable energy equipment would be built into the resulting program to promote the development of a renewable energy industry in the province (OPA 2010).

The resulting Bill 150, the *Green Energy and Green Economy Act* (GEGEA) was adopted by the Ontario legislature in May 2009. The Act mandated the development of a FIT program for renewable energy projects, streamlined the approvals process for such projects and provided the Minister of Energy and Infrastructure with expanded authority to issue directives to the OPA and OEB to ensure its implementation.⁵ The following month Smitherman announced the suspension of the province's new build nuclear procurement process, citing the unexpectedly high cost estimates contained in all of the competing bids (Winfield et al. 2010). In doing so he apparently further cemented the emergence of a new green energy policy paradigm.

As an expression of a policy paradigm, the GEGEA emphasized the ecological modernist theme of the potential for positive links between green technologies and economic development, and seemed to embed an open-ended commitment to adding renewable energy sources, developed by community-based and private sector proponents, to the electricity supply mix through the FIT program. OPG was excluded from the FIT program, and local distribution utilities were limited to projects under 10MW. The program implied a significant disruption of the OPA's IPSP planning process, further delaying the revision of the plan.

At the same time, there were concerns, even among members of the Green Energy Act Alliance itself and particularly on the part of those with long-standing involvement on energy issues, about the extent to which the legislation provided a complete and coherent model for the path forward. The legislation departed from the conventional soft path model in a number of important ways, emphasizing the development of renewable energy over other resources,

including conservation. More broadly, there were concerns about the extent to which the leadership of the alliance distanced itself from earlier critiques of the planning assumptions that guided the IPSP (Ontario Sustainable Energy Association n.d.), avoiding criticizing the government's overall policy direction in order to pursue a FIT program (confidential interview, May 2010). The alliance's approach was seen to ignore the risk that if electricity demand turned out to be less than the OPA's predictions, the centrality of nuclear energy in the IPSP process could ultimately restrict the potential for the expansion of renewable energy sources.

The initial public and investor response to the FIT and accompanying MicroFIT⁶ programs, launched in October 2009, was extremely strong. The MicroFIT program generated 47,000 applications, while the overall program produced applications for nearly 21,000 MW of new renewable energy capacity (Weis et al. 2011). As of April 2011, contracts were in place under the program for 3,759 MW of new renewable energy generating capacity (IESO 2017b). With respect to economic development, the government claimed that \$26 billion in investment had been committed as a result of the legislation and 20,000 jobs created through the program by the end of 2011 (Ministry of Energy 2011c). Notwithstanding the government's rosy assessments, the FIT program faced a host of complications. The GEGEA and FIT program were never popular with the major institutional actors within the province's electricity system – the OPA, IESO and OEB. These entities saw the GEGEA as a political override and effective rejection of the supply and/or integrated resource planning models that had re-emerged through the hybrid system planning paradigm.

The institutional landscape was further complicated by energy minister Smitherman's departure to run (unsuccessfully) for the position of Mayor of Toronto in the October 2010 municipal election, robbing the GEGEA of its most important internal champion beyond the

premier himself. Declining electricity demand, driven by the province's weak economic situation and longer-term restructuring of the Ontario economy away from energy intense manufacturing and resource processing industries, added to the challenges. With demand declining rather than growing as the OPA had assumed, the province began to face surpluses of electricity supply, principally as the new natural gas-fired and nuclear refurbishment projects committed to during the perceived 2003-2008 supply "crisis" (Spears 2011) produced an expansion of the province's installed generating capacity from 30,006MW in 2003 to 38,600MW in 2017 (Ministry of Energy 2010, Figure 5; IESO 2017a).

In this context the FIT program was seen to be encouraging new supply that was no longer needed. This was particularly the case if the government attempted to proceed with its plans for new nuclear reactors at Darlington and the refurbishment of the existing Darlington and Bruce B nuclear facilities. However, the economic viability of these projects, in comparison to conservation, renewable energy and natural gas based alternatives was seriously questioned (Ontario Clean Air Alliance 2010; Haines, Weiss and Anderson 2011). The operational inflexibility of the existing nuclear facilities was already the primary driver of the IESO's need to offer negative electricity prices to in- and out-of-province consumers during periods of low demand to use surplus supply from sources of generation whose output could not readily be reduced (IESO 2012b).

The rates paid for electricity under the FIT program became a major target of criticism. The FIT prices were well above the typical hourly electricity price in the Ontario wholesale market, prompting arguments that the province was paying more than it needed to for new supply (Auditor General of Ontario 2011; Dachis and Carr 2011).

It was pointed out by FIT supporters that the market price largely reflected the costs of supply from historic nuclear and hydro-electric assets whose capital costs had since been retired or “stranded”, as opposed to the actual contracted or projected costs of conventional (i.e. gas or nuclear) new supply. These costs were, at best, much closer to the FIT rates, particularly for wind, especially if consideration was given to the avoided environmental costs and fuel price risks provided by renewables. As a result, the impact of the program on consumer rates relative to the costs of developing non-renewable alternatives was marginal (Weis and Partington 2011). These arguments found limited political traction (Winfield and Dolter, 2014). The criticisms over costs were sufficient to prompt the province to introduce an Ontario Clean Energy Benefit, effectively reducing residential electricity bills by ten per cent, and an additional Northern Energy Benefit for northern residents (Ministry of Energy 2011). The costs of the “benefit” programs were estimated as exceeding \$1 billion per year, and criticized for encouraging energy consumption rather than conservation (Environmental Commissioner of Ontario 2011).

Renewable energy proponents also found themselves facing the emergence of some surprisingly well-organized local resistance to wind energy projects in rural southern Ontario. While the arguments of wind opponents regarding negative health impacts of wind energy were increasingly discredited (Ontario Chief Medical Officer of Health 2010; Ellenbogen et al. 2012; Saxe 2013), significant conflicts have emerged in rural communities between wind proponents, including farmers and landowners hosting facilities, and their critics (Stokes, 2013). The situation has become serious enough to prompt the Ontario Federation of Agriculture, a key member of the original Green Energy Act Alliance, to adopt, at the beginning of 2012, a new position of opposition to further wind development in rural areas until the current conflicts are resolved.

Even the GEGEA's proponents were disappointed at relatively low levels of community-based participation in the FIT program. In Germany and Denmark, individuals, cooperatives and other community-based actors constitute a high proportion of FIT project proponents (Gipe 2007; Szarka 2007). By contrast, such proponents in Ontario constituted less than 4 per cent of the total number of FIT contracts and less than 9 per cent of the total power contracted (Martin 2011, Table 7). Rather, with Ontario community proponents being far less organized than their German and Danish counterparts, participation in the program was dominated by large corporate developers. These proponents generally did not require the rates offered under the FIT program for their projects to be viable (Winfield 2015).

The overall result was increasing uncertainty over the government's actual direction. A new Supply Mix Directive was issued in February 2011 (Dugiud 2011). The directive limited the total contribution of new, non-hydro, renewable energy sources to 10,700 MW. In practice, this left little room for growth beyond what has already been contracted through the FIT program and previous initiatives. The plan also maintained a commitment to a system that was approximately 50 per cent nuclear, justifying both the pursuit of the refurbishment of the existing Darlington facility and the construction of two new reactors at the same location. Finally, the directive affirmed the OPA's assumptions that growth in demand would continue and in fact accelerate beyond 2018.

The political focus on electricity intensified in the run-up to the October 2011 election. Local conflicts over proposed off-shore wind projects, and their potential impact on the government's electoral fortunes, particularly in southern Ontario, led to an abrupt ban on such projects in February 2011. The decision reversed the government's 2008 position in favour of such projects and abandoned provisions in the FIT program specifically designed to encourage

them, further shaking confidence in the government's commitment to green energy. The GEGEA itself became a significant issue in the 2011 election campaign. The Progressive Conservatives proposed an outright repeal of the legislation, while the NDP committed to limiting the FIT program to community-based projects and, to the dismay of soft path energy advocates, turning large scale renewable energy development over to OPG. Even the Green Party made reference to restoring "local decision-making for energy projects" (Green Party of Ontario 2011) in its platform in an attempt to assuage wind energy opponents in rural Ontario. In the midst of the campaign, the government abruptly stated that it would relocate proposed gas-fired electricity plants that were the targets of strong local opposition away from Liberal-held ridings in Oakville (Jenkins and Artuso 2012) and Mississauga (CBC News 2011).

Given the positions of the opposition parties, the GEGEA's proponents breathed a sigh of relief over the McGuinty government's re-election, albeit as a "major minority" (Canadian Press, 2011) with its implication of the continuation of the FIT program.⁷ Indeed, the government's November 2011 Throne Speech noted: "Your government remains fully committed to clean energy and the 50,000 new, good jobs in one of the world's fastest-growing economic sectors." In practice the commitment would prove less categorical, particularly as some of the government's losses of rural seats were blamed on conflicts over GEGEA-inspired wind energy projects (Howlett and Ladurantaye 2011). A scheduled two-year review of the FIT program was initiated immediately after the election, but was accompanied by a moratorium on new FIT applications for the duration of the review.

The review report, prepared by the Deputy Minister of Energy and delivered in March 2012, recommended a continuation of the FIT program, and even the possible expansion of the province's renewable energy targets, subject to reductions in the FIT rates and an increased focus

on projects that were community initiated or supported (Amin 2012). The report also belatedly recommended the development of a sectoral industrial development strategy for the renewable energy sector. The strategy was initiated in the aftermath of the report (Ministry of Energy 2012). However, it was not until December 2012 that a short window for new small (<500Kw) FIT applications was opened. Among other things, the more than year-long moratorium on new projects had a devastating effect on the emerging renewable energy sector (Hamilton 2012), whose development was one of the main purposes of the legislation. The sector's fortunes were further darkened by a World Trade Organization ruling, in response to complaints from Japan and the European Union, against the local content requirements of the FIT program, resulting in the withdrawal of the requirements (Canadian Press 2013).

Paradigm 6: Political Management

In practice the 2012 FIT review marked the beginning of the end for the program. With an endorsement of the government's overall direction on electricity in the report of the Commission on the Reform of Ontario's Public Services (Drummond 2012, Ch. 12) the OPA's hybrid planning paradigm found itself in little better shape. The plan's forecasts of resumed demand growth continued to collapse in the face of the province's weak economic performance and changing economic structure. In fact, the Drummond Commission's only forecast about the future was to describe it as a "cone of uncertainty that broadens the further out into the future we look" (Drummond 2012, Ch.1).

The federal government's June 2011 sale of Atomic Energy of Canada (AECL) to SNC Lavalin removed any possibility of the realization of the province's long-held hope of a federal underwriting of the risks of new nuclear project cost overruns or delays in Ontario. Along with

SNC Lavalin's stated lack of interest in new build projects (McCarthy 2011), and the March 2011 Fukushima nuclear disaster, this raised questions about the viability of any future new build nuclear project, a core element of the plan.

The McGuinty government's final response to this situation was to move to formalize the drift towards a model of short-term decision-making driven by political management considerations, exemplified by the introduction of the Clean Energy Benefit, the off-shore wind moratorium, mid-election natural gas plant relocations and hesitation on the continuation of even a modified FIT program. Bill 75, the *Electricity System Operator Act*, introduced in April 2012, was on the surface another response to opposition criticism of the government's handling of the electricity file, particularly the proliferation of an "alphabet soup" of new agencies, merging the OPA and the IESO. However, the Bill also incorporated an abandonment of any form of formal long-term planning, removing the OPA's mandate to produce an IPSP, and instead making it clear that the system was to be guided solely by ministerial directives. The Bill died on the order paper with McGuinty's October 2012 resignation over the controversies regarding the gas-fired power plant cancellations before the 2011 election, and prorogation of the Legislature.

McGuinty was succeeded as Premier by Kathleen Wynne in February 2013. Wynne's leadership platform was silent on electricity issues, beyond a commitment to continue the coal phase out (KathleenWynne.ca 2013). The phase-out would ultimately be completed at the end of 2014. In practice the other core themes in evidence at the end of the McGuinty government on the electricity file would continue under Wynne. The FIT program for larger projects was formally terminated in May 2014, and for smaller projects as of the end of 2017. The 2013 and 2017 Long-Term Energy Plans confirmed no commitments to the development of new renewable

energy sources beyond 2018. Although the intention to build two new nuclear reactors at Darlington was abandoned in 2015 in the face of continuing weak demand, a surplus of inflexible supply and cost concerns, the refurbishments of the Bruce B and existing Darlington reactors were to continue, as was a “life-extension” for the Pickering B station, at a total cost of at least \$26 billion. In light of the massive cost-overruns on the previous Pickering and Bruce refurbishments, many observers expect the actual costs to be much higher (Gibbons 2017).

Despite the disastrous political consequences for McGuinty of the political management approach to the electricity file, the model has continued under Wynne, following her unexpected majority government victory in the June 2014 provincial election.⁸ The government’s April 2015 budget announced the intention to sell a majority of the Hydro One provincial electricity transmission grid and its rural distribution services. The stated intention was to use the proceeds to capitalize transit investments. There was no apparent electricity policy rationale for the decision. Concerns were raised around the sale given the natural monopoly inherent in the transmission and rural distribution infrastructure, the central role of that infrastructure in the evolution of the electricity system toward a “smart” grid, its importance in the integration of renewable energy sources into the electricity grid, and Hydro One’s role in the delivery of residential, commercial, and industrial energy efficiency programming in areas not served by municipal local distribution companies (Cohn 2015).

The Wynne government then, in October 2015, introduced, as Bill 135, the *Energy Statute Law Amendment Act, 2016*. The legislation was effectively the same as that first proposed as Bill 72 by the McGuinty government. The bill, which was ultimately adopted in June 2016, merged the

IESO and OPA, and eliminated the requirement for the development and publication of IPSPs by the merged entity or for their review by the OEB before implementation. Instead system plans would be developed by the Minister of Energy and approved by the cabinet. The OEB and IESO would then be required to implement those plans. In effect, the legislation dropped the pretense of rational planning, subject to meaningful independent public review, for the province's electricity system, and formalized the paradigm of political management.

A major expression of that political management paradigm came at the beginning of March 2017. With high hydro costs being consistently identified as the leading public concern facing the province (Nanos 2016), the government announced a "Fair Hydro Plan," intended to reduce electricity rates by 25 per cent for the following five years, beginning July 1, 2017 (Office of the Premier, 2017). The intention was to remove the issue of hydro rates from the political agenda before the provincial election expected in 2018. The plan relies principally on extending the financing period for debt associated with new electricity infrastructure, typically from twenty to thirty years. The potential additional financing costs of this approach, along with the elimination of the HST on hydro bills, has been estimated at \$45 billion, with the costs largely falling on future consumers (Auditor General of Ontario 2017). The approach of extending the amortization period for assets also effectively extends the expected life of those assets, reducing the technological flexibility of the system at a time of very rapid technological change in the electricity sector. Rising electricity pricing have particularly affected low-income consumers. However, their situation could have been addressed much more cost-effectively through targeted measures, rather than across-the-board rate cuts, which benefit the largest (and typically higher income) consumers the most.

Advancing Sustainability and Stability?

A supply planning model governed electricity policy from the beginning of the twentieth century. By the 1970s, the weaknesses of this model were becoming evident. The “bigger is better” mentality was contested by emerging social movements responding to the negative environmental, social and economic costs of such a model. Its planning assumptions were challenged by emerging economic realities. Attempts to incorporate emerging soft energy path elements related to conservation and renewable energy sources into an integrated resource management model collapsed as the financial legacy of the supply planning model drove Ontario Hydro towards virtual bankruptcy.

The adoption of the market model attempted to improve the efficiency of the province’s electricity system by moving away from central planning and instead relying on private investment to plan the system. The failure of that paradigm led to an *ad hoc* hybrid model, which attempted to incorporate elements of both the integrated resource planning and market models.

A combination of criticism of the resulting IPSP, particularly over-optimistic demand forecasts and underestimated nuclear costs, the emergence of new ideas regarding the potential roles of green energy options and the 2008 economic crisis opened a window for yet another potential paradigm, embodied in the 2009 GEGEA. However, that paradigm failed in the face of resistance from key institutional actors in the electricity system, criticism over costs and technical viability and the emergence of well-organized local opposition to wind energy projects. In its final stages the McGuinty government moved in the direction of formalizing a framework of explicit political management through the proposed Bill 75. The government of McGuinty’s successor, Kathleen Wynne, continued the political management paradigm, ultimately adopting

the core contents of Bill 75 as Bill 135, and moving forward with the sale of Hydro One Networks, costly and risky nuclear refurbishments, and the enormously expensive Fair Hydro Plan. The costs and risks associated with these paths, in the absence of any widely accepted underpinning economic, environmental, technical, or social rationales for them beyond political expediency, suggest that further major shifts in direction are likely regardless of whatever government emerges through the election expected in June 2018.

Table 1 summarizes the elements that have come together to create policy windows through which each new system paradigm has advanced over the past century, as well as the key policy entrepreneurs responsible for pushing the paradigm forward.

Table 1 Policy Paradigms in Ontario Electricity Policy, 1906-2017

Paradigm	Policy	Problem	Politics	Policy Entrepreneur
Supply Planning (1906-1980)	“Power at cost”.	Private development of Niagara hydroelectric resources.	“The Politics of Development”.	Sir Adam Beck.
Integrated Resource Management (1980-1995)	Lovins; “soft” energy paths; Porter Commission.	Darlington delays and cost overruns; supply over-construction.	Fall of the PC “dynasty”; Liberal/NDP “quiet revolution.”	Liberal and NDP ministers and staff; ENGOs.
Markets (1995-2002)	Competitive market models from US and UK.	Collapse of DSP and Ontario Hydro in “crisis.”	The “common sense revolution.”	Academic economists; Energy Probe; AMPCO.
Planning/Market Hybrid (2002-2009)	Electricity Conservation and Supply Task Force report; Select Committee on Alternative Fuels.	Failure of market experiment.	2003 election; arrival of McGuinty government.	Minister, political staff and premier’s office.

The Green Energy Economy (2009-2011)	Germany and Denmark FIT programs; US states and Obama administration.	2008 Economic downturn; coal-phase-out.	ENGO criticism of IPSP; 2007 election and Smitherman appointment; need to respond to 2008 economic crisis.	Green Energy Act Alliance.
Political Management (2011-)	Premier's office and ministers' offices.	Collapse of IPSP demand assumptions; wind opposition; gas plant crisis; FIT cost debates.	2011 election – opposition pressure on energy file.	Premier's Office, party and ministerial staff.

The overall picture over the past three decades is one of remarkable policy instability, where different constituencies have taken the opportunity provided by each policy window to move the system in radically different directions. The primary contributor to this instability has been the increasing complexity of the political, social and economic environment in which electricity policy must be formulated and implemented.

The historical consensus around the system's goal of cheap and abundant electricity has collapsed in the face of the need to address wider societal concerns around environmental sustainability and develop more sophisticated economic strategies. Core assumptions about demand growth and its relationship to economic prosperity and the cost, safety and reliability of nuclear energy have broken down, while new ideas, technologies and constituencies have emerged and gained strength. However, none of the policy paradigms of the past thirty years has carried sufficient legitimacy to survive the next policy window, a problem enhanced by the increasing politicization of decision-making.

At the same time, despite the instability in terms of the various governments' policy directions, the inertia of Ontario Hydro's hard path, supply orientation has continued to define much of the

system's actual path. Nuclear now constitutes a substantially higher portion of supply than it did at the beginning of the millennium (61 per cent of generation in 2016 versus 42 per cent in 2003 – Ministry of Energy 2010; IESO 2017). This hard path momentum has continued to carry the system in the opposite direction to the principles of sustainability outlined at the beginning of the chapter. The pattern of radical changes in policy direction and hard path inertia seems destined to continue unless steps are taken to build consensus around the system's goals and structure.

Although there have been a number of semi-formal and *ad hoc* reviews, there has been no comprehensive and open review of the system's goals, structure and options since the report of the Porter Commission, now more than thirty years ago. Such a review, undertaken by an entity outside of the existing institutional structure and without interests within it, may be the only way that assumptions about the system's role in the province's society and economy, and the social, economic, environmental and technological context within which the system must operate can be examined and debated openly. Such a process offers the best hope for overcoming conflicting visions and the emergence of some form of enduring consensus around the system's purposes and direction.

Whatever emerges, the system will need a planning framework to guide its long-term direction. That framework, however, must be far more resilient, flexible and adaptive than anything that has gone before it. It must also integrate the wider range of objectives now being sought through the province's electricity system in a manner that captures an appropriate democratic and ecological balance while advancing sustainability.

Bibliography

Amin, F. 2012. *Ontario's Feed-in Tariff Program: Two-Year Review Report*.
<http://www.energy.gov.on.ca/docs/en/FIT-Review-Report.pdf>

Auditor General of Ontario. 2011. *Reports by Year: 2011*. <http://www.auditor.on.ca>.

Auditor General of Ontario, 2017, *Special Report: The Fair Hydro Plan: Concerns about Fiscal Transparency, Accountability and Value for Money*, Toronto: Queen's Printer.
http://www.auditor.on.ca/en/content/specialreports/specialreports/FairHydroPlan_en.pdf

Benzie, R. 2001. "Harris to impose speedy deregulation of hydro in Ontario," *The National Post*, March 1.

Bill 150: An Act to enact the Green Energy Act, 2009 and to build a green economy, to repeal the Energy Conservation Leadership Act, 2006 and the Energy Efficiency Act and to amend other statutes. 2009. Legislative Assembly of Ontario.

World Commission on Environment and Development (a.k.a. the Brundtland Commission) 1987. *Our Common Future* Oxford: Oxford University Press.

Canadian Press. 2011. "Horwath says McGuinty Would be Wise to Work with Opposition," *iPolitics*, October 7. <http://www.ipolitics.ca>.

Canadian Press, 2013. "Ontario to change green energy law after WTO ruling," *The Globe and Mail*, May 29, 2013.

Canwest News Service. 2010. "Ontario Signs Green Energy Deal with Samsung Team," *The Financial Post*, January 21.

CBC News. 2011. "Liberals halt Mississauga power plant: Gas-powered plant will be relocated," *CBC News*. Retrieved from <http://www.cbc.ca/news/canada/toronto/story/2011/09/24/tor-election-power-plant.html>.

Cohn, M.R., 2015. "Why Kathleen Wynne's Hydro One Sell-off Is a Sellout: Cohn," *Toronto Star*, 18 May 2015.

Dachis, B. and Carr, J. 2011. *Zapped: The High Cost of Ontario's Renewable Electricity Subsidies*. Retrieved from <http://www.cdhowe.org/why-ontarioper-expensive-electricity-subsidies-should-be-zapped/13570>

Daniels, R.J. and Trebilcock, M. 1996. "A Future for Ontario Hydro: A Review of Structural and Regulatory Options," in R. Daniels (Ed.), *Ontario Hydro at the Millennium: Has Monopoly's Moment Passed?* Toronto, ON: University of Toronto Press.

Doern, B. and Gattinger, M. 2003. *Power Switch: Energy Regulatory Governance in the Twenty-First Century*. Toronto, ON: University of Toronto Press.

Doern, G.B. and Toner, G.B. 1985. *The Politics of Energy: The Development and Implementation of the National Energy Program*. Toronto, ON: Methune.

Drummond, D. 2012. "The Need for Strong Fiscal Action," in *Commission on the Reform of Ontario's Public Services*. Ministry of Finance, <http://www.fin.gov.on.ca/en/reformcommission/>

Dryzek, J. 2005. *The Politics of the Earth: Environmental Discourses*. New York, NY: Oxford University Press.

Duguid, B. 2011. *Ministry of Energy Supply Mix Directive*.
http://www.powerauthority.on.ca/sites/default/files/new_files/IPSP_directive2020110217.pdf

Duncan, D. 2006. *Directive to OPA re: Integrated Power System Plan*. Toronto, ON: Ministry of Energy.

Electricity Conservation and Supply Task Force. 2004. *Tough Choices: Addressing Ontario's Power Needs*. <http://www.ospe.on.ca>.

Ellenbogen, J. et al. 2012. *Wind Turbine Health Impact Study: Report of Independent Expert Panel*. Boston, MA: Massachusetts Department of Health Protection, Massachusetts Department of Public Health.

Environmental Commissioner of Ontario. 2011. *Managing a Complex Energy System*.
http://www.eco.on.ca/index.php/en_US/pubs/energy-conservation-reports/cdm10v1-managing-a-complex-energy-system.

Freeman, N. 1996. *The Politics of Power: Ontario Hydro and its Government 1906 – 1995*. Toronto, ON: University of Toronto Press.

Galt, D. 2002. *Select Committee on Alternative Fuel Sources: Final Report*. Legislative Assembly of Ontario.

Gans, Hon. A. 2002. *Transcript of Oral Judgement, Ontario Superior Court of Justice Bryan Payne on his own behalf and on behalf of all members of the Communications, Energy and Paperworkers Union of Canada, and Judy Darcy on her own behalf and on behalf of all members of the Canadian Union of Public Employees, and James Wilson and Her Majesty the Queen in Right of Ontario*. April 19, 2002 (File No. 01-CV-227522 CM3).

Gibbons, J. 2008. "Ontario's Energy System Ripe for Shakeup." *The Toronto Star*.
<http://www.cleanairalliance.org/node/573>.

Gibbons, J., 2017. "Ontario's Electricity Options: A Cost Comparison" *Fact Sheet*, October 3, 2017. <http://www.cleanairalliance.org/wp-content/uploads/2017/10/options-2017.pdf>.

Gibson, R.B. 2006. "Sustainability assessment: basic components of a practical approach," *Impact Assessment and Project Appraisal*, 24:3: pp. 170-182.

Gipe, P. 2007. *Wind Energy Cooperative Development in Anglophone Canada: For the Canadian Cooperative Association*. <http://www.cpfund.ca/pdf/windenergy.pdf>

Government of Alberta. 2012. *Alberta Energy – Oil Sands Facts and Statistics*. <http://www.energy.alberta.ca/oilsands/791.asp>

Green Energy Act Alliance. 2008. *A Vision of a Greener Energy System for Ontario*. http://www.greenenergyact.ca/Storage/22/1366_A_Vision_of_a_Greener_Energy_System_for_Ontario_23-09-08.pdf

Green Party of Ontario. 2011. *Its Time: A Five Point Plan for Ontario's Future*. Toronto: GPO.

Haines, G., T. Weiss and K. Anderson. 2011. *Analysis New Nuclear: Darlington Environmental Impact Statement*. Drayton Valley: Pembina Institute.

Hamilton, T. 2008. "Time for Green Act in Ontario," *The Toronto Star*. <http://www.thestar.com/business/article/435083>

———. 2008b. "The Wind at His Back," *The Toronto Star*, http://www.maegaard.net/news/Smitherman_The_wind_at_his_back.pdf

———. 2012. "Ontario teaches world how not to run a FIT program," *The Toronto Star*, <http://www.thestar.com/business/article/1267380--ontario-teaches-world-how-not-to-run-a-fit-program>

Howlett, K. and Ladurantaye, S. 2011. "How McGuinty's green-energy policy cost him a majority in Ontario," *The Globe and Mail*, <http://www.theglobeandmail.com/news/politics/how-mcguintys-green-energy-policy-cost-him-a-majority-in-ontario/article556454/>

Howlett, K., Morrow, A., and Waldie, P. 2012. "Ontario Premier Dalton McGuinty Resigns," *The Globe and Mail*.

Independent Electricity System Operator (IESO). 2012. *18-Month Outlook: From December 2012 to May 2014*. http://www.ieso.ca/imoweb/pubs/marketReports/18Month_ODF_2012nov.pdf

———. 2012a. *Supply Overview*. http://www.ieso.ca/imoweb/media/md_supply.asp.

———. 2012b. *Surplus Baseload Generation* http://www.ieso.ca/imoweb/pubs/consult/se91/se91-20120808-SBG_Explanation_FPFG.pdf.

- . 2017, *2016 Year End Data*, <http://www.ieso.ca/corporate-ieso/media/year-end-data>
- . 2017a, *Ontario's Supply Mix: Installed Capacity – Transmission System*. Toronto: IESO. <http://www.ieso.ca/learn/ontario-supply-mix/ontario-energy-capacity>.
- . 2017b, *A Progress Report on Contracted Electricity Supply FOURTH QUARTER 2016*. IESO 2017. www.ieso.ca/-/media/.../contracted.../progress-report-contracted-supply-q42016.pdf?...
- Jaccard, M. 2005. “What is Energy Sustainability?” in M. Jaccard, *Sustainable Fossil Fuels: The Unusual Suspect in the Quest for Clean and Enduring Energy*. New York, NY: Cambridge University Press.
- Jenkins, J. and Artuso, A. 2012. “Cancelled Oakville gas plant to be moved to Napanee,” *St. Catharines Standard*. <http://www.stcatharinesstandard.ca/2012/09/24/cancelled-oakville-gas-plant-to-be-moved-to-napanee>
- Joshi, R. 2012. *Energy Security for Ontario*. Toronto: Mowat Centre for Policy Innovation.
- Kingdon, J.W. 1995. *Agendas, Alternatives and Public Policies*. New York, NY: Harper Collins.
- Lovins, A. 1980. Hard versus soft energy paths. *Alternatives* 8(3/4).
- Macdonald, D.S., Carr, J., Gillespie, R., Grant, J., McKeough, W.D., Sutherland, S., and Waverman, L. 1996. *A Framework for Competition: The Report of the Advisory Committee on Competition in Ontario's Electricity System to the Ontario Minister of Environment and Energy*. Ministry of Environment and Energy. <https://ozone.scholarsportal.info/bitstream/1873/6669/1/10258213.pdf>
- Martin, S. 2011. *The Sustainability Case for Community Power: Empowering Communities Through Renewable Energy*. Unpublished Master's major paper. <http://sei.info.yorku.ca/files/2012/03/MRP-SEI-Final-Sarah-Martin-July-27-references.pdf>
- McCarthy, S. 2011. “Ottawa to sell AECL to SNC-Lavalin,” *The Globe and Mail*. <http://energyquest4nanticoke.ca/accel.htm>.
- Mitchell, T. 2011. *Carbon Democracy: Political Power in the Age of Oil*. London: Verso.
- Ministry of Energy. 2010. *Ontario's Long-Term Energy Plan*. Toronto: Queen's Printer.
- . 2011. *Ten Per Cent Relief on Electricity Bills Starts Today: McGuinty Government Helping Families with Energy Costs, Increasing Consumer Protections* [News release]. <http://news.ontario.ca/mei/en/2011/01/ten-per-cent-relief-on-electricity-bills-starts-today.html>

———. 2011b. *Green Energy Act Creates 20,000 Jobs: McGuinty Government Supporting Clean, Renewable Energy* [News release]. <http://news.ontario.ca/mei/en/2011/07/green-energy-act-creates-20000-jobs.html>

———. 2011c. *Ontario's Solar Energy Industry Creating Jobs: McGuinty Government Building a Clean, Modern, Reliable Electricity System* [News release]. <http://news.ontario.ca/mei/en/2011/12/ontarios-solar-energy-industry-creating-jobs.html>

———. 2012. *Expanding Ontario's Clean Energy Economy: McGuinty Government Launches Clean Energy Economic Development Strategy* [News release]. <http://news.ontario.ca/mei/en/2012/04/expanding-ontarios-clean-energy-economy.html>.

———. 2013. *Ontario's Long-Term Energy Plan*. Toronto: Queen's Printer. http://www.energy.gov.on.ca/en/files/2014/10/LTEP_2013_English_WEB.pdf

———. 2017. *Ontario's Long-Term Energy Plan*. Toronto: Queen's Printer. <https://www.ontario.ca/document/2017-long-term-energy-plan>

Ministry of Finance. 2010. [Chart 2, Ontario Employment Pre- and Post-Recession]. *2010 Ontario Budget: Chapter II: Ontario's Economic Outlook and Fiscal Plan*. http://www.fin.gov.on.ca/en/budget/ontariobudgets/2010/ch2c.html#c2_secC_chart2.

Nanos Research, 2016. "Hydro rates are the top issue for Ontarians; PCs lead and Wynne takes an image hit." November 2016. <http://www.nanosresearch.com/sites/default/files/POLNAT-S15-T711.pdf>.

Nanos Research, 2016. *Ontario Political Snapshot*. Ottawa: Nanos Research, November. <http://www.nanosresearch.com/sites/default/files/POLNAT-S15-T711.pdf>

Office of the Premier, 2017. "Ontario Cutting Electricity Bills by 25 Per Cent System Restructuring Delivers Lasting Relief to Households Across Province," *News Release*, March 2, 2017.

O'Connor, D. 2002. *Walkerton Commission of Inquiry Reports*. Ontario Ministry of the Attorney General, <http://www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton>

Ontario Clean Air Alliance. 2010. *Darlington Rebuild Consumer Protection Plan* Toronto: Ontario Clean Air Alliance Research, <http://www.cleanairalliance.org/files/active/0/darlington.pdf>

Ontario Chief Medical Officer of Health. 2010. *Potential Health Impact of Wind Turbines*. Toronto: Ministry of Health and Long-Term Care.

Ontario Power Authority. 2007. *Re: Ontario Power Authority, Integrated Power System Plan and Procurement Process, Ontario Energy Board File No.: EB-2007-0707*. <http://www.rds.oeb.gov.on.ca/webdrawer/webdrawer.dll/webdrawer/rec/12969/view>

- . 2010. *FIT Program, microFIT Program*.
<http://fit.powerauthority.on.ca/home.html?q=domestic-content-1>
- Ontario Power Generation, 2016. *Annual Information Form for the year Ended December 31, 2015*. Toronto: OPG. https://www.opg.com/about/finance/Documents/OPG_2015_AIF.pdf
- Ontario Power Generation Review Committee. 2004. *Transforming Ontario's Power Generation Company*. Toronto, ON: Ministry of Energy.
- Ontario Sustainable Energy Association. n.d. *Advocacy: Feed-In Tariffs*. <http://www.ontario-sea.org/Page.asp?PageID=122and ContentID=2266>. Accessed December 18, 2012.
- Rabe, B., ed. 2010. *Greenhouse Governance: Addressing Climate Change in America*. Washington, DC: Brookings Institution Press.
- Robinson, J.B. 1982. "Apples and Horned Toads: On the Framework-Determined Nature of the Energy Debate," *Policy Sciences*, 15:1: pp. 23-45.
- Saxe, D. 2013. "Anti-wind litigation: Is there an end in sight?" *Environmental Law and Litigation* February 12 <http://envirolaw.com/>.
- Skogstad, G. 2008. *Internationalization and Canadian Agricultural Policy: Policy and Governing Paradigms*. Toronto, ON: University of Toronto Press.
- Smitherman, G. 2008. *Notes for Remarks*. Toronto, ON: Ministry of Energy and Infrastructure.
- Spears, J. 2011. "Ontario's new dilemma: Too much power," *The Toronto Star*.
<http://www.thestar.com/business/article/925248--ontario-s-new-dilemma-too-much-power>.
- Stokes, L. C. (2013). "The Politics of Renewable Energy Policies: The Case of Feed-in Tariffs in Ontario, Canada," *Energy Policy*, 56, 490–500.
- Swift, J. and Stewart, K. 2004. *Hydro: The Decline and Fall of Ontario's Electric Empire*. Toronto: Between the Lines.
- Swisher, J.N., Jannuzzi, G.M., and Redlinger, R.Y. 1997. *Tools and Methods for Integrated Resource Planning: Improving Efficiency and Protecting the Environment*, Working Paper No. 7. United Nations Environment Programme. <http://ncsp.undp.org/sites/default/files/486.pdf>
- Szarka, J. 2007. *Wind Power in Europe: Politics, Business and Society*. Hampshire, UK: Palgrave Macmillan.
- Weis, T. 2010. *Canada falling even further behind the U.S. in sustainable energy investments per capita*. The Pembina Institute. <http://www.pembina.org/pub/1979>

Weis, T., Gipe, P., Green Energy Act Alliance, and Shine Ontario. 2011. *Ontario Feed-in-Tariff: 2011 Review*. The Pembina Institute. <http://www.pembina.org/pub/2299>

Weis, T. and Partington, P.J. 2011. *Behind the switch: pricing Ontario electricity options*. The Pembina Institute. <http://www.pembina.org/pub/2238>

Winfield, M. 2012. *Blue-Green Province: The Environment and the Political Economy of Ontario*. Vancouver, BC: University of British Columbia Press.

Winfield, M., 2015. "Ontario's Green Energy and Green Economy Act as an Industrial Development Strategy" for S.McBride and C. Carla Lipsig-Mummé eds., *Work and the Challenge of Climate Change: Canadian and International Perspectives*. Kingston and Montreal: McGill-Queens University Press.

Winfield, M., 2016. "Electricity Planning and Sustainability Assessment: The Ontario Experience," for R.B. Gibson, ed., *Sustainability Assessment: Applications*, London: Earthscan.

Winfield, M., 2017. "Energy policy is falling behind the energy revolution," *The Globe and Mail*, May 15.

Winfield, M., and Dolter, B. (2014) "Energy, Economic and Environmental Discourses and their Policy Impact: The Case of Ontario's Green Energy and Green Economy Act." *Energy Policy* 68 423-435.

Winfield, M., Gibson, R., Martvart, T., Gaudreau, K., and Taylor, J. 2010. "Implications of sustainability assessment for electricity system design: The case of the Ontario Power Authority's integrated power system plan," *Energy Policy*, 38: pp. 4115-4126.

World Commission on Environment and Development (Brundtland Commission) 1987. *Our Common Future*. Oxford University Press.

KathleenWynne.ca, 2013. "Enable Communities to Prosper," accessed 25 March 2013.

¹ The authors wish to thank Sarah Goldstein for her research and editorial assistance in preparing this chapter.

² The Government of Alberta currently estimates domestic and international investment commitments to the oil sands in the range of \$100 billion (Alberta 2012).

³ This was debt that the corporation had no reasonable prospect of being able to repay and which would have rendered the successor corporations, particularly OPG and Hydro One, unable to function effectively. The debt was paid down through a 'debt retirement charge' on consumers' electricity bills.

⁴ Bruce Power is a private consortium that took over operation of the Bruce Nuclear Facility in 2001 as a result of the Harris government's directive that OPG reduce its share of the province's electricity generation capacity from over 85 per cent to 35 per cent by 2010.

⁵ Legislation also established a process for setting CDM targets for electricity distribution utilities, but also eliminated the position of Chief Energy Conservation Officer and the Conservation Bureau within the OPA. The Energy Conservation Officer's reporting responsibilities were transferred to the Environmental Commissioner of Ontario.

⁶ For projects 10 Kilowatts or less in capacity.

⁷ The election outcome was Liberals 53 seats; Progressive Conservatives 37; and NDP 17.

⁸ The Liberals emerged with 58 seats (a gain of 10 seats), the PCs 28 (a loss of 9 seats), and the NDP 21.