

Accelerated Phase Out of Coal-Fired Electricity Generation Socio-Economic Impact Parkland



Electricity Generation in Parkland County

- Electricity generation is an important part of economic and social fabric in Parkland County
- The area's vast supply of clean (low sulphur, thermal-grade) coal has facilitated the development of a vigorous electricity generation sector
- Over the past 60 years, residents, households, businesses, and community groups have benefitted directly and indirectly through the sector's
 - creation of high-paid, stable jobs
 - local procurement and spending
 - payment of property tax, and
 - ongoing investment in community initiatives

Government Intervention

- The GOA's Climate Leadership Plan was introduced in 2015. It will:
 - accelerate the phase out of coal-fired electricity generation in Alberta
 - alter the structure of the industry through the requirement to introduce greater shares of renewables into the generation mix
 - restructure the existing deregulated wholesale market by introducing a capacity-based market
- Each of these actions will require industry to evaluate its approach to electricity generation in Parkland County and across the province
- The GOA is taking a two-step approach to implementing its coal policy:
 - It worked with industry in 2016 to sign Off-Coal Agreements aimed at ending coal-fired emissions on or before December 31, 2030
 - It established the Advisory Panel on Coal Communities to consult with affected municipalities, First Nations, workers and businesses

A Municipal Focus

- Parkland County Council is very concerned that ongoing changes within the industry will have significant consequences for residents, businesses and municipalities in the region
- It has reached out to its municipal neighbours, community groups, residents and businesses to get a better understanding of these consequences
- It and its partners want to proactively engage in understanding and planning for possible future impacts (as well as opportunities)
- This study was commissioned to provide Parkland County with an independent, expert assessment of possible socio-economic impacts
- The study informed Parkland County's:
 - submissions to the Advisory Panel and
 - efforts to negotiate impact mitigation with both the Provincial and Federal governments

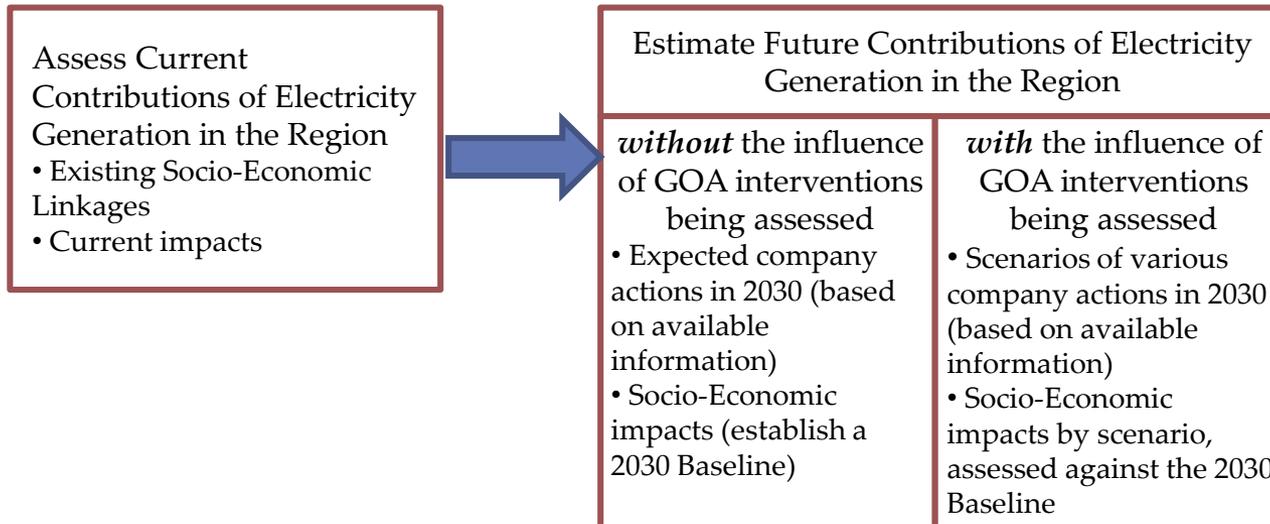
Considerations

- Energy generation is a complex sector, influenced by evolving provincial, national and international political, environmental and economic factors
- Changes within the sector occur over a relatively long period of time (2030 being a key milestone)
- Socio-economic and fiscal impacts will be dictated by industry decision-making in response to:
 - **Technical** considerations, including the age and technology of existing facilities and new generation options (including renewables)
 - **Regulatory** considerations, particularly evolving federal and provincial environmental regulations
 - **Market** considerations (electricity grid supply/demand trends, fuel supply costs, market structure, and opportunities in other markets)
- Currently, there is substantial uncertainty within Alberta's electrical generation market
 - Affects industry's ability to plan
 - Creates uncertainty for affected parties (employees, suppliers, host and neighbouring municipalities)

Approach

- To assess an expected impact at a future date, consideration must be given to how the future could be expected to unfold *without* the impact
 - Against that setting (future baseline), the changes *with* the impact can be assessed

Analytical Approach



Consideration of Future Factors

Changes In Motion *before* GOA Interventions in 2015:

Age of Facilities:

- Sundance 1-6 reaching end of life between 2019 and 2029
- Keephills 1-2, by 2029

Broader Climate Change Agenda:

- Coal-Fired Electricity Generation Federal regulations, implemented in 2015, influencing lifespan of existing coal-fired facilities
- Trend away from coal-fired to gas-fired generation globally

Company Plans In Response:

- Retirement of existing Sundance coal-fired phases (over next fifteen years)
- Introduction of gas-fired replacement plants in the Parkland County
- Sundance 7 – planned, received regulatory approval and at point of sanctioning
- Ongoing consideration for other future investments in the region and beyond, but dependent on market considerations and broader economic and regulatory environment

Considerations of Future Factors

Based on those Factors...

Assumptions

Pre-GOA interventions, 1000 MW (22% of existing) generation capacity in the region was on a pathway to retirement

- This is in part influenced by Federal regulations, but also economic factors
- Also influenced by market uncertainties (changing economic conditions)
- As of 2015, 1,900 MW in new generation capacity was on the books via Sundance 7 (representing roughly 55% of current 2017 capacity in the region)
- Therefore, the 2030 Baseline consists of:
 - existing operating plants (Keephills 3 including support mines)
 - new gas plants (Sundance 7)

****While it is entirely possible more generation capacity would come forward in the region by 2030 to address overall future provincial grid demand, sufficient uncertainty exists at the moment to limit confidence in predicting further installed capacity, particularly given approved projects on-hold and industry options for investing elsewhere. The result is a more conservative Baseline scenario in 2030.**

Considerations of Future Factors

Impacts of Provincial Government Policy Interventions in 2016:

Interventions in the Electricity Market:

- Price structure / purchase agreements
- Requirement for increased renewable sources in the future

New Environmental Legislation:

- Complete phase-out of coal-fired emissions
- Resulted in acceleration of future closures for newer phases by 10 to 30 years

Company Plans in Response:

- Negotiated Off-coal agreements with the GOA
- Planned and approved gas-fired phases for 5 to 10 years

Considerations of Future Factors

Based on those Factors...

Assumptions

Future scenarios in 2030 consider hypothetical company actions, including various combinations of the following:

- Total closure of all facilities in the region
- Closure of coal-fired units (and support mines) and partial conversion of newer units to gas
- New proposed gas plant (Sundance 7) proceeding
- One mine remaining open for export operations

Scenarios

Scenarios			TransAlta		
Scenario #	Scenario Name	Scenario General Description	Highvale Mine	Sundance	Keephills
Baseline 2030		Situation before GOA Interventions	Smaller mine to support KH3 in Operation	SD7 Gas In Operation	KH3 coal in Operation
Scenario 1	Maximum Impact	Total Closure All Generation	Closed	Closed	Closed
Scenario 2	Medium Impact	Mining closure, Partial Generation Conversions, One New Project	Closed	SD 3-6 Gas Conversion in Operation	KH1-2 Gas Conversion in Operation
Scenario 3	Minimum Impact	Partial Mining closure, Partial Generation Conversions, Both New Projects	Mine at 50% capacity for export	SD 3-6 Gas Conversion and SD7 Gas In Operation	KH1-3 Gas Conversion in Operation

Other Assumptions:

Change in Operation:

- Reduced operational workforces and expenditures required for gas-fired generation
- Future procurement and workforce resident patterns remain consistent with current
- Reduction in mining activities in-line with remaining coal-fired generation at 2030
- In export scenario, mine assumed to operate at 50% of current capacity

Fiscal / Property Tax:

- 2% annual increases to non-residential tax rates
- Closed facilities assumed to be non-assessable
- Assessment on new gas-fired facilities estimated based on comparable projects
- New natural gas feedstock line constructed in the region

Capital Construction:

- Short term effects related to conversions or closures not considered

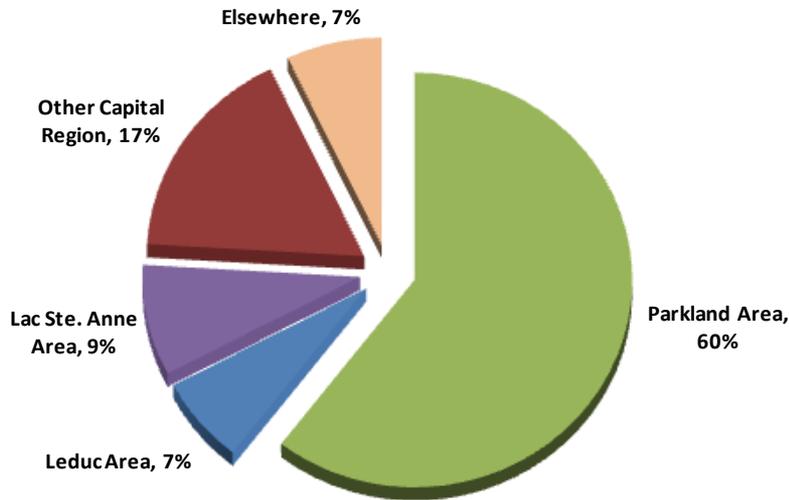
Socio-Economic Conditions:

- Projections of future community populations within the study area based on municipal estimates (when available) or long-term historical growth rates
- Future baseline socio-economic conditions (employment, household composition, school enrolment, social conditions, demographic factors) assumed to reflect current state

Socio-Economic Linkages to Generation in the Parkland County

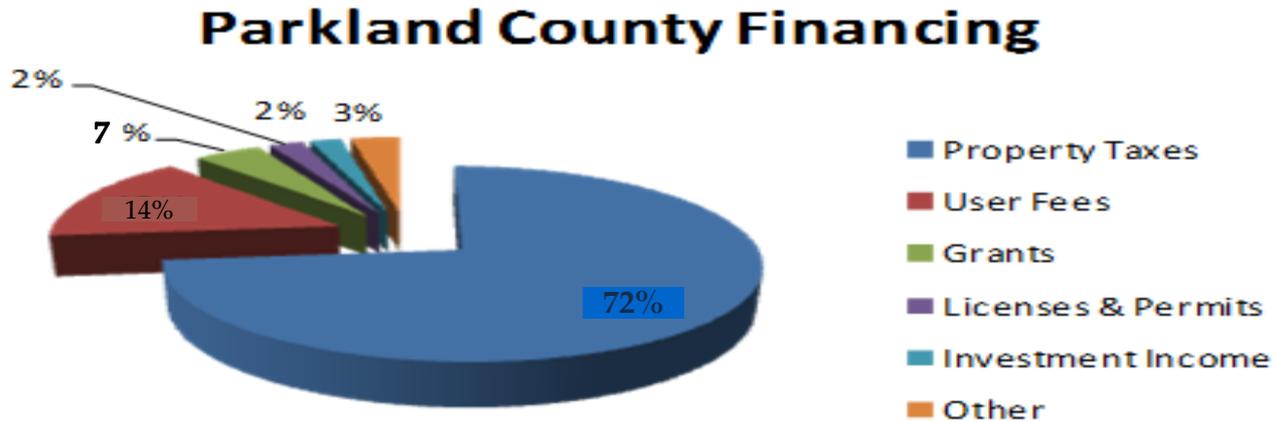


Residence Location of Direct Workers



- The majority (60%) of the electricity generation workforce lives in the Parkland Area (including the County, Stony Plain, Spruce Grove and other communities within)
- 9% live in the Lac Ste. Anne area
- 7% live in the Leduc Area
- 17% elsewhere in the Capital Region
- 7% outside of the study area / Capital Region

Contribution to Property Taxes



- Parkland County relies primarily on property taxes to finance municipal programs, services and infrastructure
- 72% of municipal revenues come from property taxes

Economic Contributions

	GDP	Labour income
Annual (2017 Estimate)	\$M	
Parkland County	\$220	\$110

- Electricity Generation currently contributes annually \$220 million of gross domestic product and \$110 million labour income to Parkland County.

Contributions to Community Services, Facilities and Events

- The electricity generating industry is committed to supporting a wide range of community services and events through
 - financial investment
 - provision of services in-kind
 - encouraging and incenting employees to volunteer within communities
- Community investments are designed to support community-based education, arts and cultural programs and to promote non-profit organizations, registered charities and community organizations
- The industry has contributed significantly to many community facilities, including the TransAlta Leisure Centre, parks and conservation sites, seniors facilities, etc.
- The industry's ongoing commitment to helping keep communities vibrant and strong has resulted in it becoming an important part of the social fabric of the region

Contributions to First Nations People and Communities

- Industry works closely with the First Nations to provide employment, contracting and training opportunities
 - Direct employment, as well as specific work placement programs
 - Contracting services, including for turnarounds
 - Apprenticeships
- Industry supports First Nations educational programs
 - Scholarships and bursaries
 - Hot lunch programs
 - First Nations Reclamation Education Program
- Industry supports various First Nation community initiatives

Contributions to Farming within Parkland County

- Similar to elsewhere in Alberta, family farms in the study area rely heavily on off-farm income to maintain operations
- Access to well-paid full-time and part-time employment within the electricity generation sector is critical for many farmers in the region
- Off-farm employment helps diminish the financial risks associated with agricultural activities
- Off-farm employment
 - improves the standard of living of many farm families
 - improves the resilience of farming operations in the region
 - supports rural living
 - preserves smaller communities



Impacts to Employment

Change in Employment – Baseline 2030

Total (Direct, Indirect, Induced) Employment (Generation + Mining)	Current (2017)	Baseline 2030	Change in Employment	as % of Current
Parkland Area	1,110	380	-720	-65%

Additional Changes in Employment – Impact Scenarios from Provincial Policies

Total (Direct, Indirect, Induced) Employment (Generation + Mining)	Baseline 2030	Additional Impacts (above Baseline)			
		Scenario 1	Scenario 2	Scenario 3	Scenario 2 as % of Baseline
Parkland County	-730	-380	-1000	-730	-137%

Property Tax Implications in a Worst Case Scenario

Parkland County would have limited options in responding to the loss of tax revenues associated with changes in the electricity generation sector

- Increase tax rates on other non-residential taxpayers
- Increase residential tax rates
- Decrease service levels and infrastructure standards
- Reduce or eliminate
 - program expenditures
 - cost-sharing with other municipalities
 - financial support of community groups and initiatives
- Potential revenue lost
 - Scenario 1 - \$131 million
 - Scenario 2 - \$121 million
 - Scenario 3 - \$0 million

Property Tax Implications in a Worst Case Scenario

The tax implications for residents and other businesses could be significant. For example, where all tax revenues associated with electricity generation were lost this could result in:

- Parkland County would need to consider potential of a 50% tax increase to maintain existing services and service levels

Major reductions in municipal service levels, including:

- road and bridge maintenance
- fire protection and response services
- bylaw enforcement and enhanced policing services
- parks and recreation programs and facilities

Property Tax Implications in a Worst Case Scenario

The loss or reduction of electricity generation facilities would not result in reduced costs for either municipality

In fact, it is very likely that expenditure demands on both municipalities would increase in response to the need to provide additional funding to

- Family and Community Social Service programs and services to support workers who have lost their jobs and families who have lost their household incomes
- Community groups and organizations which have lost the financial support they were previously receiving through industry initiatives
- Recruit and train new volunteer fire fighters to replace those that were associated with industry
- Support community infrastructure which was previously supported by industry (e.g., TransAlta Leisure Centre)

Key Conclusions

- The electricity generation sector is shifting dramatically, globally and regionally
- Even before the Province's climate change policy, key indicators (output, expenditures, employment) of the generation sector in the region are forecasted to change substantially
- The Province's climate change agenda is amplifying these changes and is adding uncertainty to the sector
- The potential socio-economic effects to Parkland County from future change is dependent on industry's response(s)
- These changes will impact the region's residents, businesses, community organizations and municipalities

Key Conclusions

- Fewer people will be working in this sector in 2030 than at present. Between 2017 and the 2030 Baseline, **employment** levels in Parkland County reduce by 720 direct/indirect/induced jobs
 - up to 730 **households will be affected** by job losses in the 2030 Baseline. Most of these will need to seek other work.
 - up to an additional 180 households could be affected by the GOA-induced changes
- The overall **population** levels may not measurably change through the above-listed impacts. This is due to the influence of a number of factors:
 - job losses occurring over time
 - the commitment of industry to manage direct workforce reductions
 - a fast growing region natural population base
 - the region's robust economy, which provides alternative employment opportunities
- The Provincial and Federal Government must work together with municipalities to not leave them stranded. No single party should be left behind.

Key Conclusions

- The industry's contribution to the **regional economy** will be lower in the future. The sector's contribution to GDP and labour incomes will reduce by 68% under the Baseline 2030 estimate
 - Further reductions would occur due to the GDA policy effects
- As long as electricity generation remains in the region, **communities will benefit** from stable employment opportunities, local procurement and community-based social investment programming.
 - These contributions are particularly important to specific communities, including villages and hamlets in the western half of the study area, the Paul First Nation and many farming operations dependent on off-farm income.
 - Reductions to employment in these communities can have a noticeable, negative impact

So What Now?

1. Government of Alberta to ensure linear tax and associated losses are managed accordingly
2. Government of Alberta to acknowledge impact analysis and sign memorandum of understanding with Parkland County for investment offset
3. Continue to educate, inform and seek feedback from our residents
4. Stay the course, keep on point