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Powerful Opportunities*TM

**BUILDING RENEWABLE ENERGY CAPACITY
SEPT 22, 2016**



ABOUT FIRST NATIONS POWER AUTHORITY



First Nations
Power Authority™

What is FNPA?

FNPA – a non-traditional not-for-profit power developer mandated to **facilitate** and develop opportunities for its First Nation Membership on a cost-recovery basis.

We are 63 Members -14 First Nation and 55 Industry

Management is 67% Indigenous.



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FNPA Benefits in Saskatchewan

SaskPower

1. **First Nation Engagement:**
 - a. Relationship Management
 - b. Education – Sector & SaskPower
 - c. Project Development Support
 - d. Economic Development Advice

2. **Shared Objective in Renewables and Environment** - 1,000MW = 4.4 Mt CO₂e offset to meet coal retirement / growth needs

3. **Procurement Options**
 - a. Ideal for testing new technologies, strategic projects & new business arrangements.

Provincial Government

1. **First Nation Economic Development**
Real Projects, Genuine Engagement

2. **Local Investment Retention**
Procurement stays in SK

3. **New Sector Development**
Supports Oil & Gas & Renewables

4. **Attracts Outside Investment**
Options for private sector financing

5. **Improved Outcomes for Gov't** -
targets investment / reduces risk

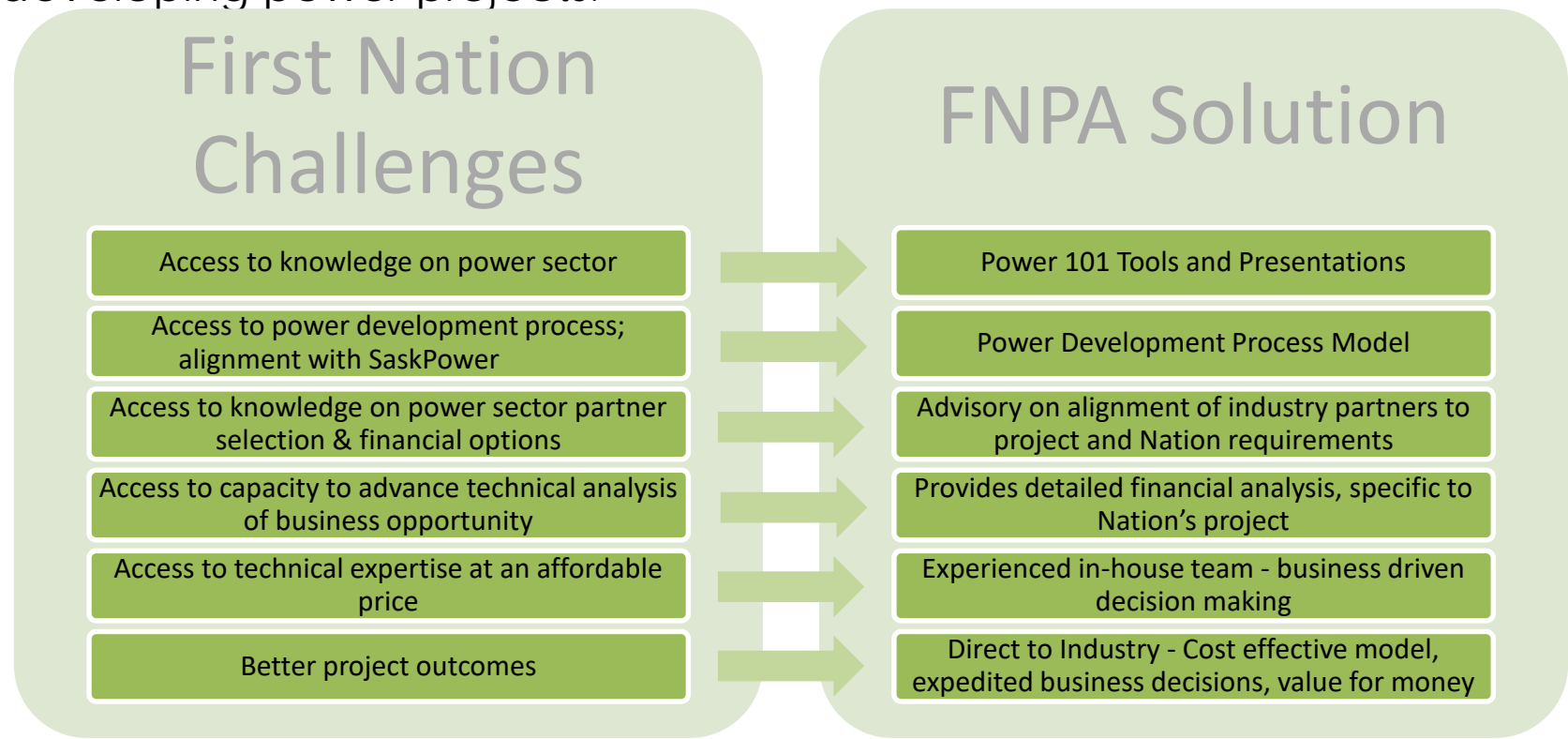
6. **1,200+ jobs & training opportunities**



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Why is FNPA needed? – Realizing the Benefits

FNPA was created from a need to improve relationship with Saskatchewan and make First Nation proponents more successful at developing power projects:

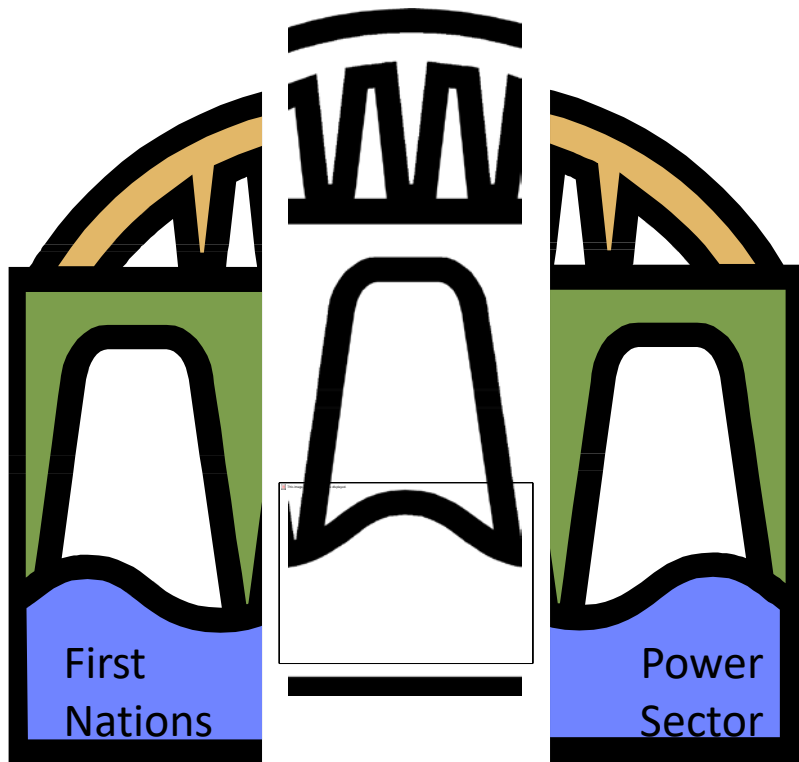


**Key to Success: Objective, third party analysis
driven and owned by First Nation needs.**



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Lessons Learned



1. **OBJECTIVE:** 3rd party
2. **EXPERIENCE:** Power industry expertise essential.
3. **KNOWLEDGE TRANSFER:** Retain key decision making with the Nation.
4. **AFFORDABLE:** Cost-Recovery Fee Structure.
5. **OPTIMIZE INVESTMENT:** Timing



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FNPA Achievements

- 2011, FNPA MoU with Province of Saskatchewan and SaskPower
- 2013, FNPA and SaskPower announced 10 year Master Agreement
- 2014, FNPA installs 16kW solar with File Hills Qu' Appelle Tribal Council and Lockheed Martin Canada at Swift Current, SK.
- 2015, SK's largest roof-top solar installations on schools in Fond du Lac and Hatchet Lake Dene First Nations in Saskatchewan's North
- 2016, \$162M (40MW) announced with Saskatchewan for projects with multiple Nations
 - Flying Dust First Nation 20MW Flare Gas
 - Multiple Nations 20MW utility scale solar



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FNPA Membership

- **General Members: 14+ = 40 Communities**

- FHQ Developments (11), George Gordon Developments Ltd., Beardy's and Okemasis First Nation, MLTC Resource Development (9), Red Earth Developments, Wahpeton Dakota Developments, Whitecap Development Corporation, Misty Ventures, Montreal Lake Business Ventures LP, Peepeekisis Developments Inc., Saskatoon Tribal Council (7), KDM Business Development Corp (3)., Flying Dust First Nation, Pheasant Rump Nakota First Nation

- **Industry Members: 49+**

- Algonquin Power (HQ: Ottawa, International); BluEarth Renewables (HQ: Calgary, National); GE Energy (HQ: Ottawa, International); Lockheed Martin Canada (HQ: Kanata, International); Renewable Energy Systems Canada (HQ: Montreal, National), Points Athabasca FHQ, Points Athabasca Contracting, MiEnergy, Bullfrog Power, Valard Construction LP, Mastec Transmission Services, Kinetikor Resource Corp, Fengate Capital Managements, Stonebridge Financial, EDF EN Canada Development, Urban Systems, PEK Group, CLR Construction Labour Relations, AMP Solar, Gengrowth Solar Energy, Midgard Consulting, NextEra Canada Development Acquisitions, Graham Industrial Services, Potentia Solar Inc., Canadian Solar Solutions Inc., Pioneer Energy LLC, Sage Stone Inc, EDP Renewables Canada Ltd., Macksun Solar, Saturn Power, Sweeney Electric Ltd., BHE Canada LP, Gas recapture Systems Ltd, Samsung C & T Corporation, WPD Canada Corporation, Innergex Renewable Energy Inc, Dillon Consulting Limited, Saskatchewan Chamber of Commerce, Bastion Power Inc., Harbert Power Fund V, LLC, Sunroof Energy Corp, AllSys Biogenics Inc., 3G Energy Development Inc.

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FNPA Board of Directors – First Nation Leadership

Tribal Chief Felix Thomas, Chairperson, HR, Projects (*Saskatoon Tribal Council*)

Crystal Fafard, Vice Chair, Secretary, Governance & Nominations, Projects (*Maurice Law Firm*)

AJ Felix, Treasurer, Audit & Finance Chair (*Founder & President, Jasper Enterprises Inc.*)

Lee Ahenakew, Governance & Nominations Chair, HR (*Lee Ahenakew & Associates*)

Harvie Campbell, Projects Chair, Governance & Nominations, HR (*Bastion Power*)

Mariana Mora, Finance & Audit, HR (*RBC Commercial*)

Chief Reginald Bellerose, Strategic Communications (*Chair/CEO, Muskowekwan Resources Ltd.*)

Darryl McDonald, Audit & Finance, Projects, Strategic Communications (*Miqmac Economic Development*)

Vice Chief Robert Merasty, Projects (*Federation of Saskatchewan Indian Nations*)



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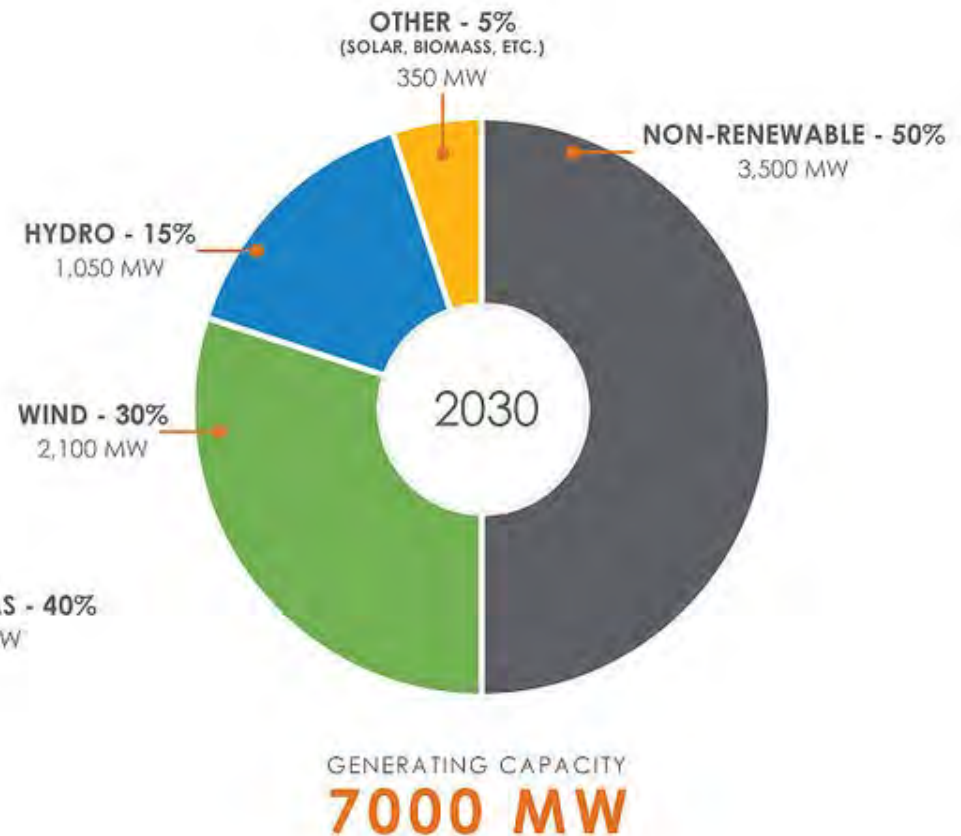
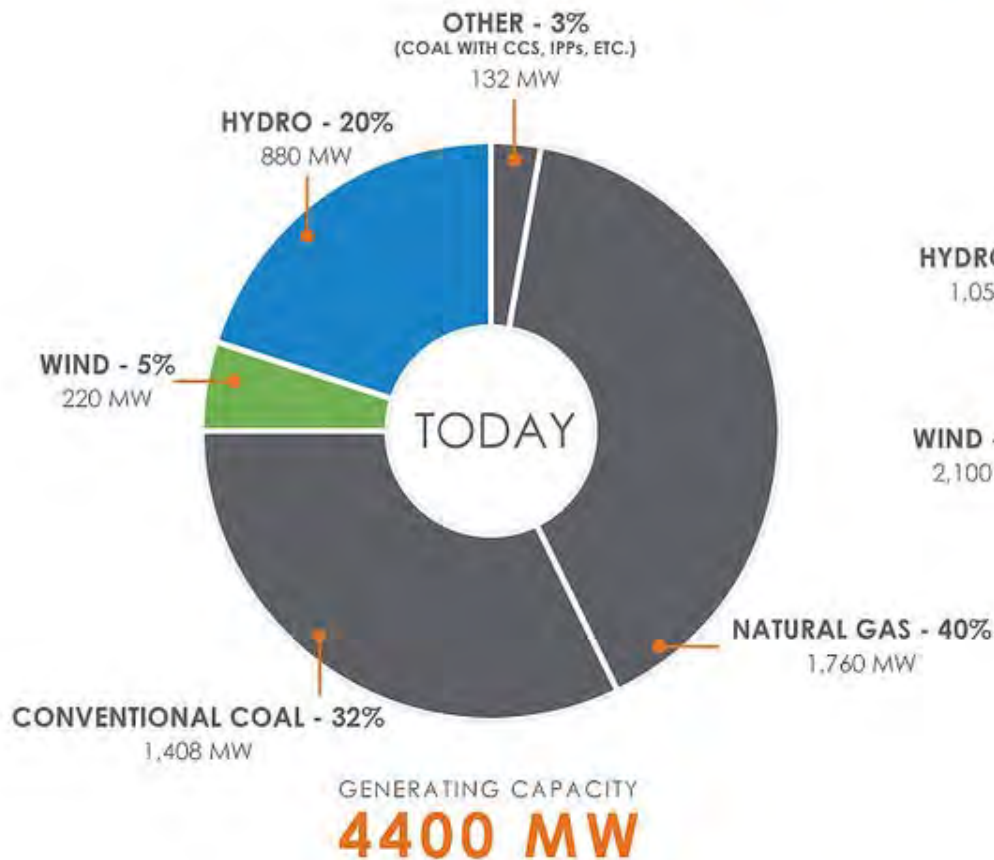
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RENEWABLE ENERGY OUTLOOK IN SASKATCHEWAN



- Megawatts, Kilowatts, Watts, Negawatts (energy efficiency)
- Hair dryer: 1000 watts= 1 kW
- Turn it on for one hour= 1 kWhr (about \$13 cents!)
– (*\$0.13/kWh*)
- Turn on 1000 Hair dryers= 1 MW of capacity
- Leave them on for 1 hour!! 1 MWhr (about \$130)
– (*\$130/MWh*)
- Red Lily 26 MW wind farm- each turbine is ~2 MW!!!

Saskatchewan's Potential FUTURE POWER MIX





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Power Price Ranges (Costs)

Power Prices

Retail Power: 8 - 13 cents /kWh

Wind Power: 7-8 cents /kWh

Utility Solar Power: Unknown –12-17cents/ kWh??

Rooftop Solar: 10-12 cents/kWh/ <10 cents with SaskPower Rebate

Biomass: 12 cents/kWh

Hydro: 14-25+cents /kWh

Flare Gas: 8-10 cents/kWh

Natural Gas Combined Cycle: 6-7 cents/kWh

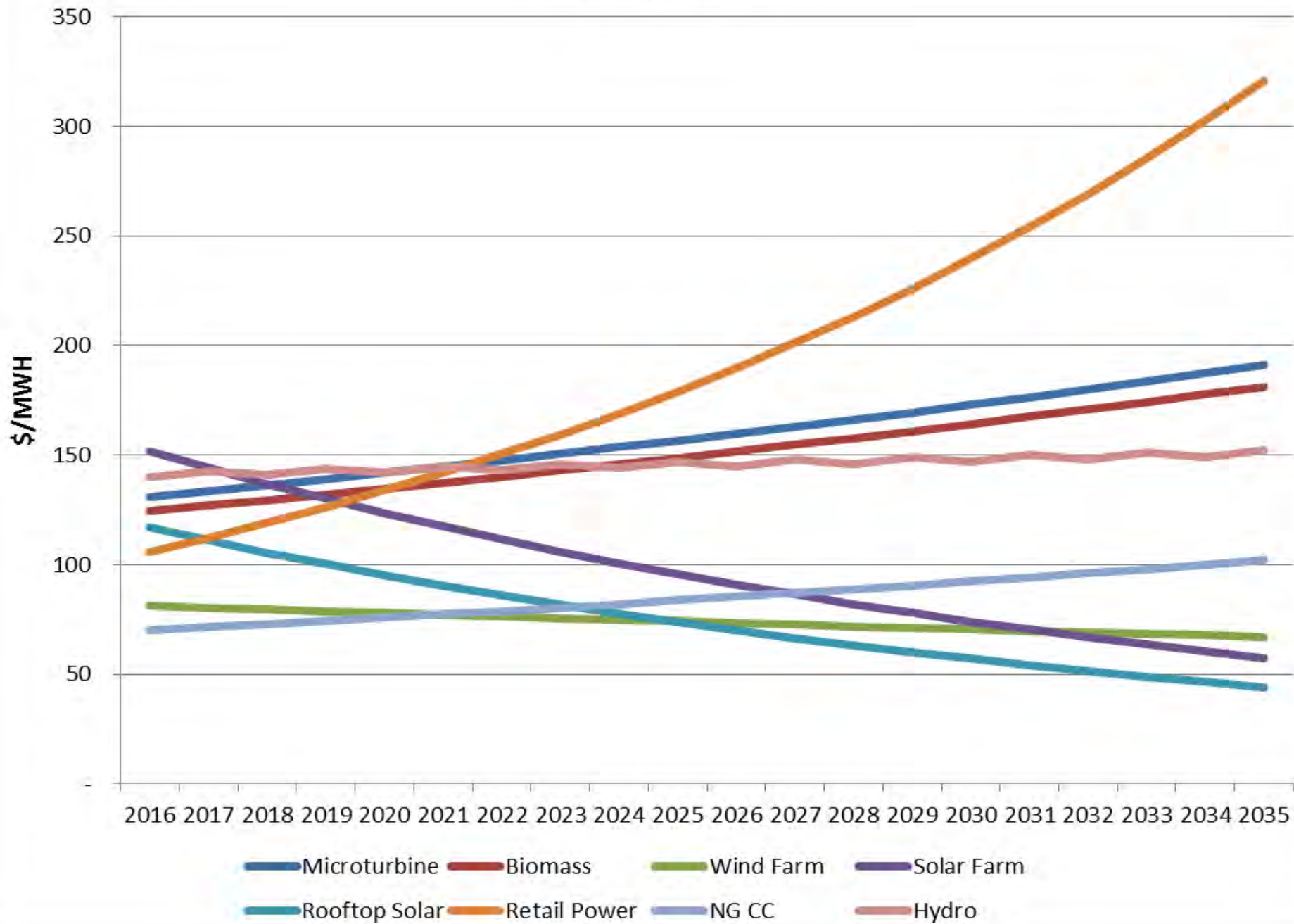
Coal: 4 cents/kWh

Clean Coal: More than coal

Nuclear: Unknown?

Deep Geothermal: 10-11 cents/kWh

Power Costs





Power Storage Options

- Compressed Air
- Batteries- NaS, Li-Ion, Aluminum Air, Lithium Air
- Flow Batteries (Vanadium)
- Flywheel
- Gravity hydro



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Power Economics-Utility Power

Debt to Equity Ratios: 70%/30%; 60%/40%

Return on Equity: 12 to 13%

Internal Rate of Return: 8 to 10 %

Cost of Debt: 2.5% to 6%

In Sask 20-40 year Power Contracts



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GETTING INVOLVED AND CAPACITY BUILDING



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FNPA – Developing Indigenous Capacity in Renewable Energy Infrastructure

FNPA provides third-party, **objective technical & business** support to Indigenous leaders in developing Green Energy projects.

Indigenous Communities & Industry -63 members and growing!

REAL RESULTS - \$3M Federal invested produced **\$162M projects today**

FUTURE - \$4B under development

PATH AHEAD – Indigenous demand exceeds capacity - **National Growth Plan**



- The Right Size is What Size?
- Community Level – Small Scale Power
 - Band office level involvement
 - Offset power bills in community
 - Easier to complete; shorter time; less capital
 - Results are easier to realize
 - Local, in community jobs can be created
- Utility Scale Power Project
 - Likely economic development corp initiative
 - High cost; long timelines; lower success rates
 - Large benefits – Jobs, procurement, investment



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Community Energy Hierarchy

- Lowest Cost: Energy Conservation- Behaviours
 - turn out the lights; turn heat down; close windows
- Lower Cost: Energy Efficiency- Technology
 - LED lights; high efficiency furnace; extra insulation in the building
- Higher Cost: Energy Generation-Self generation
 - Roof top solar best option
 - Self generation kWh costs are equal to utility price****



Community Level – Small Scale (<100 kW)

- Current SaskPower Programs
 - Net Metering (up to 100 kW);
 - Small Power Producers (up to 100KW)
- Average House in SK: 3- 5 kW of Roof top solar
 - Ice Rink: 20-30 kW
 - Band office: 20-30 kW
 - School : 30-65 kW
- Small wind is a non starter
- Geothermal (Ground source heat pumps)
- Energy efficiency in houses and buildings are more economic than power generation options



Utility Scale Power Projects

Utility Scale Power Generation Options

- **Greater than 100 kW capacity**
 - Wind Power (25-150 MW optimum)
 - Solar Electric (photovoltaics)- 5MW+ (10-20 MW optimal)
 - Biomass- Feedstock dependent 5-30 MW
 - Hydro – site dependent 5 MW -50 MW
 - Natural Gas
 - Coal
 - Clean Coal
 - Nuclear
 - Flare Gas – greater than 1 MW (ideal 4 MW -20 MW)
 - Deep Geothermal – 10 MW +



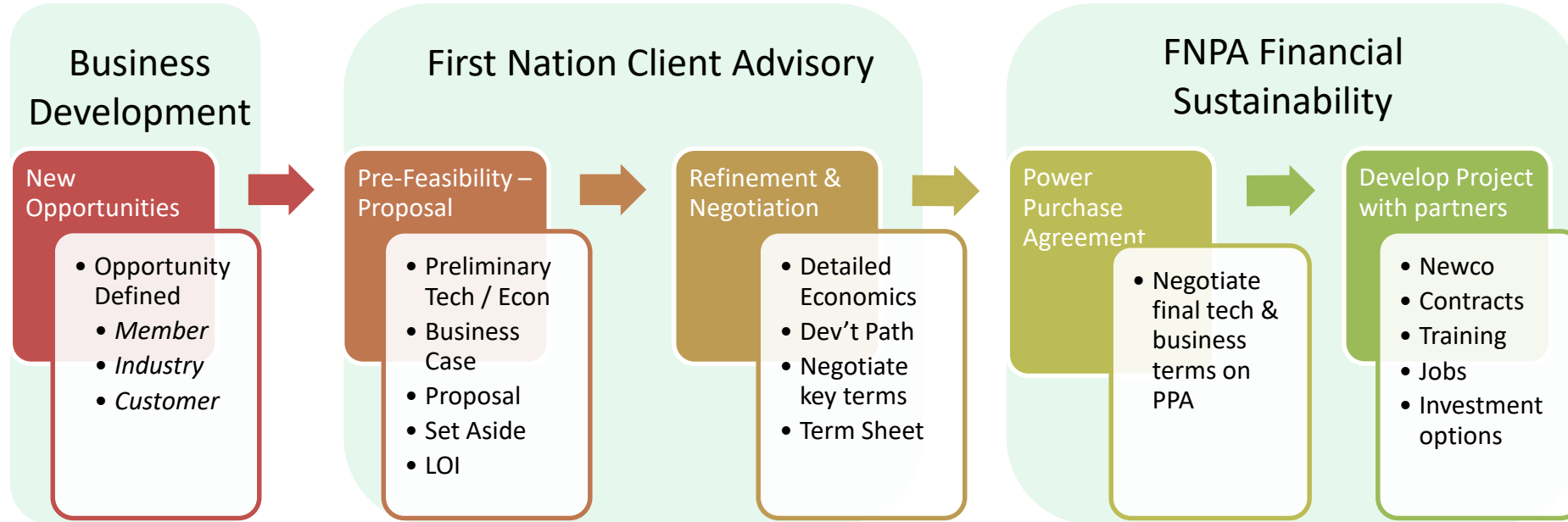


Project Development Timelines



POWER GEN TYPE	Identify Project	SPC Negotiation/ Procurement	Technical Review	PPA / Legal	Vendors / Permits / Finance	EPC	TOTAL DEV'T CYCLE
Biomass	1-1.5 years	1-2 years	1-2 years	0.5 year	0.5-2 years	1.5- 2 years	5.5-10 yrs
Wind	1-3 years	1 year	1-2 years	0.5 year	1.5-3 year	1-1.5 years	6-11 yrs
Hydro	1-5 years	1-5 years	3-5 years	1-3 years	2-5 years	3-5 years	11-25+ yrs
Solar PV	1-2 years	0.5 year	0.5 year	0.5 year	0.5-1 year	0.5 year	3.5-5 yrs

FNPA Project Development



Risk High; Success probability <10%

1-2 yrs

Risk Medium; Success probability <50%

1-5 yrs (to COD)

Risk Low; Success probability >90%

PPA to COD up to 3 yrs

Project is commercial operating

COD to length of PPA (20-40 yrs)

FNPA Power Project Development Steps

1. Opportunity

Power project opportunity identified by Nation, Industry or FNPA

- Project must align with industry needs and technical limitations.

2. Pre-Feasibility

Initial evaluation on technology, grid connect, financial returns and contract

- FNPA Membership required, proposal submitted to Member to conduct Pre-Feasibility Analysis on project. Pre-Feasibility analysis is required to define and develop proposal. If Pre-Feasibility Analysis positive, moves to Business Plan Stage 3.

3. Business Plan

Business plan is developed and marketed to potential off-takers

- Proposal marketed to industry early in process to provide a yes/no decision on their interest in pursuing project further. If proposal is accepted, project advances to Stage 4 to negotiate formal project agreements.

4. Agreements

Term Sheets, Contracts through to Power Purchase Agreements

- Negotiation to determine project pricing, interconnect requirements and cost, contract terms, development timelines, procurement requirements, financial investment. With final agreements, new company is created – advance to Stage 5.

5. Partnerships & Newco

Identification of project partners and creation of new power development company.

- A single entity must hold all of each the PPA, the assets the investment with an equity structure that reflects the investment of each party. Once corporate entity is established, project financing can be secured in Stage 6.

6. Financing

Project Development Milestone – Project sold to investors for a Development Fee.

- Project secures financial investment, primarily from private sector. Equity arrangements are made for Aboriginal proponent(s) and FNPA. Development Fee can be taken at Financial Close as cash, equity investment into project or combination of both.

7. Procurement, Training & Jobs

Finances secured to initiate procurement on components, contracts and mobilize work force.

- Procurement process must demonstrate competitive pricing for goods & services. Opportunity to develop Aboriginal Capacity – corporate, training, career development.

8. Construction

Vendors secured for project management, system procurement, engineering, construction

- Once project financing has been secured, activities related to proceeding with project construction are secured – project management, procurement of system, constructor and operations and maintenance provider.

9. Operation

Electricity (& or heat) is generated for sale to Industry as per PPA terms.

- Power facility reaches Commercial Operation Date and continues to operate for the duration of the power purchase agreement – 10-40 years.



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