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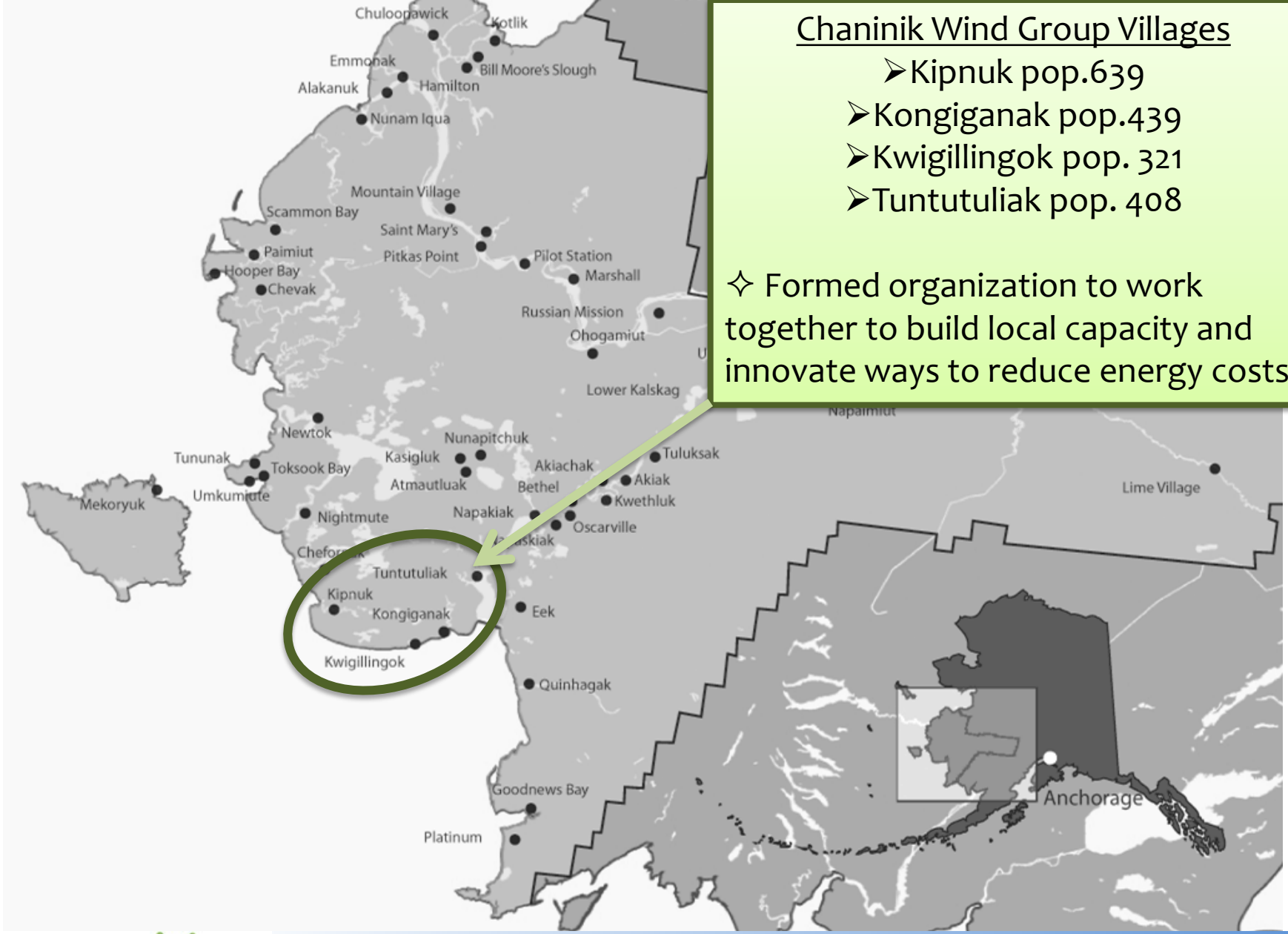

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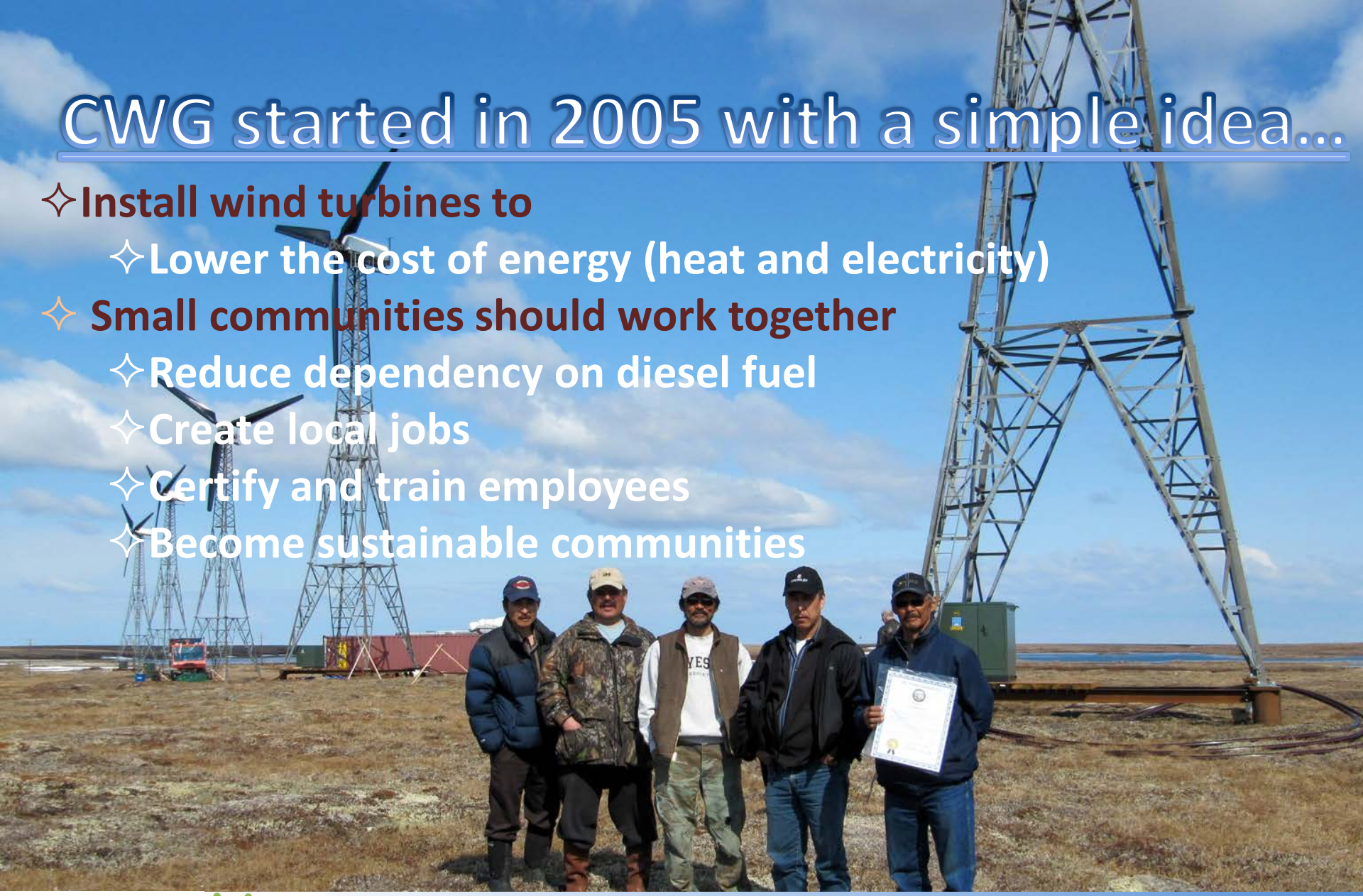
CWG started in 2005 with a simple idea…

- Install wind turbines to
  - Lower the cost of energy (heat and electricity)
- Small communities should work together
  - Reduce dependency on diesel fuel
  - Create local jobs
  - Certify and train employees
  - Become sustainable communities



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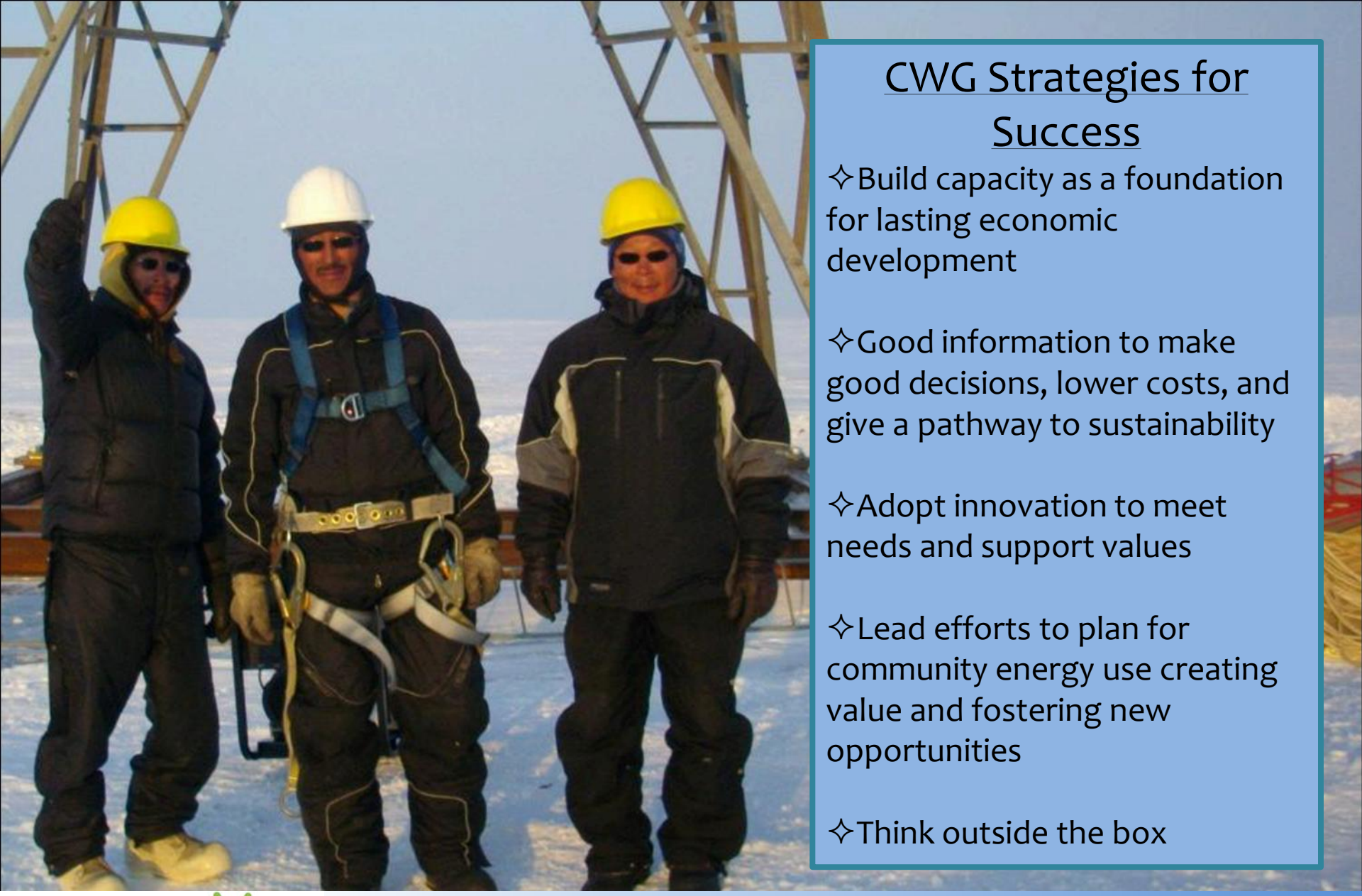

CWG Strategies for Success

✧Build capacity as a foundation for lasting economic development

✧Good information to make good decisions, lower costs, and give a pathway to sustainability

✧Adopt innovation to meet needs and support values

✧Lead efforts to plan for community energy use creating value and fostering new opportunities

✧Think outside the box

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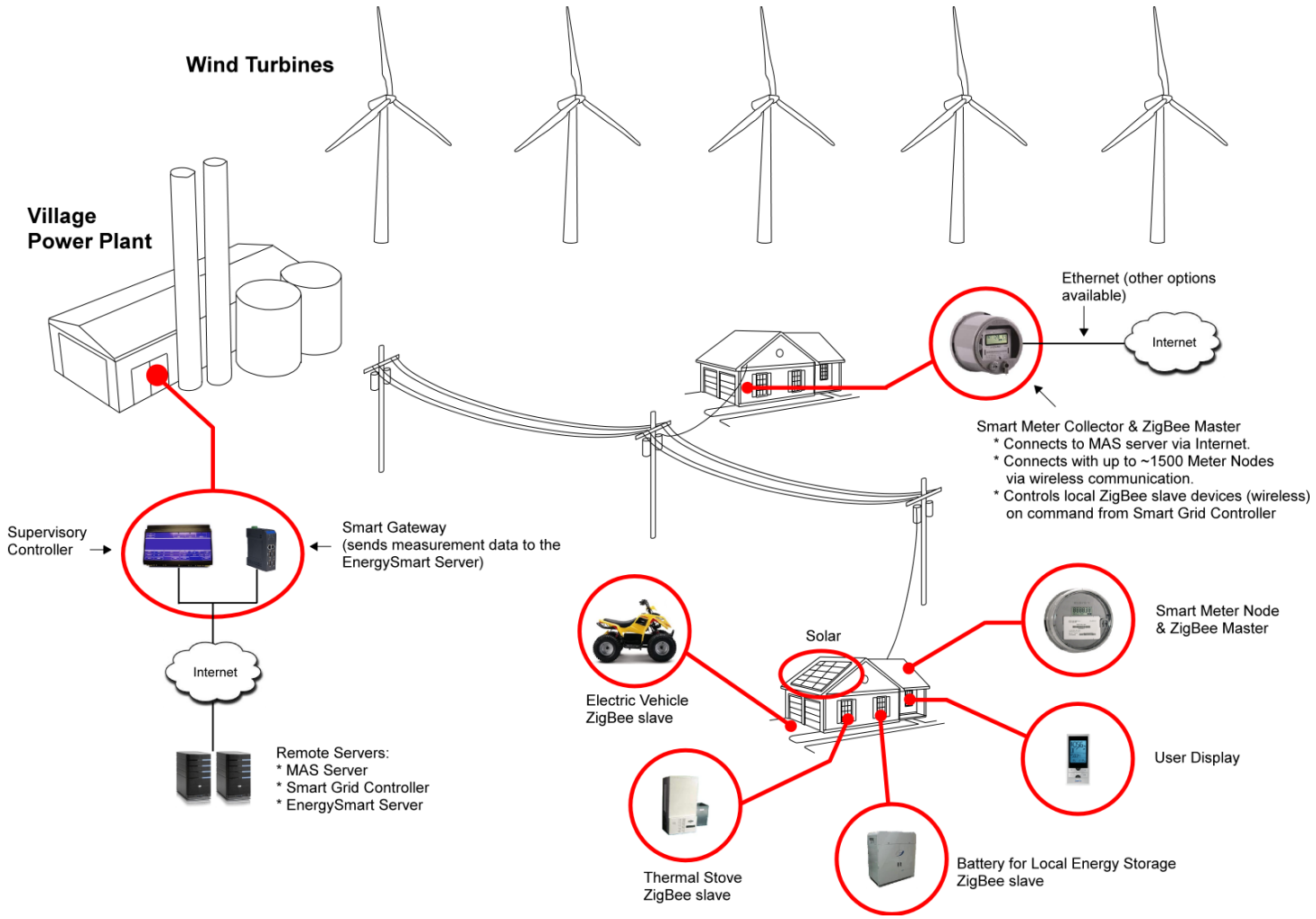
Wind Heat Smart Grid Design



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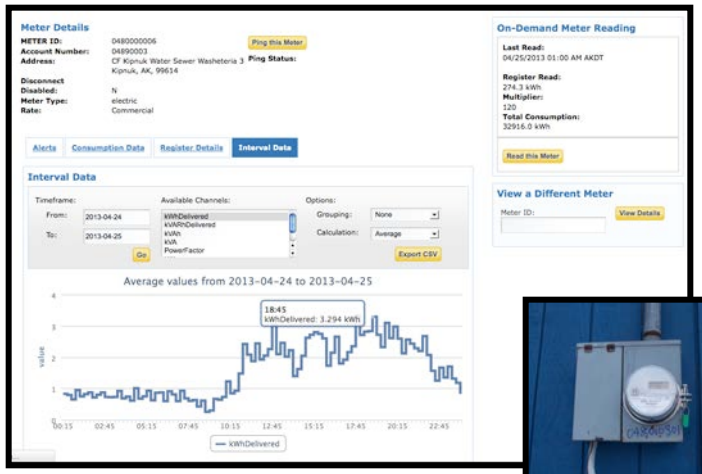
Wind Heat System Components



Systems in Kongiganak, Kwigillingok and Tuntutuliak

- 95 kW Windmatic wind turbines
- Electric Thermal Storage(ETS) devices
- Community-wide Smart Metering and Smart Grid control

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Electronic Thermal Stoves (ETS)

- ETS heat output at high is equivalent to a Toyostove Laser 56
- $.10 per kwh is equivalent to buying diesel at $2.90 per gallon
- Current diesel price in Kongiganak: $6.95 per gallon

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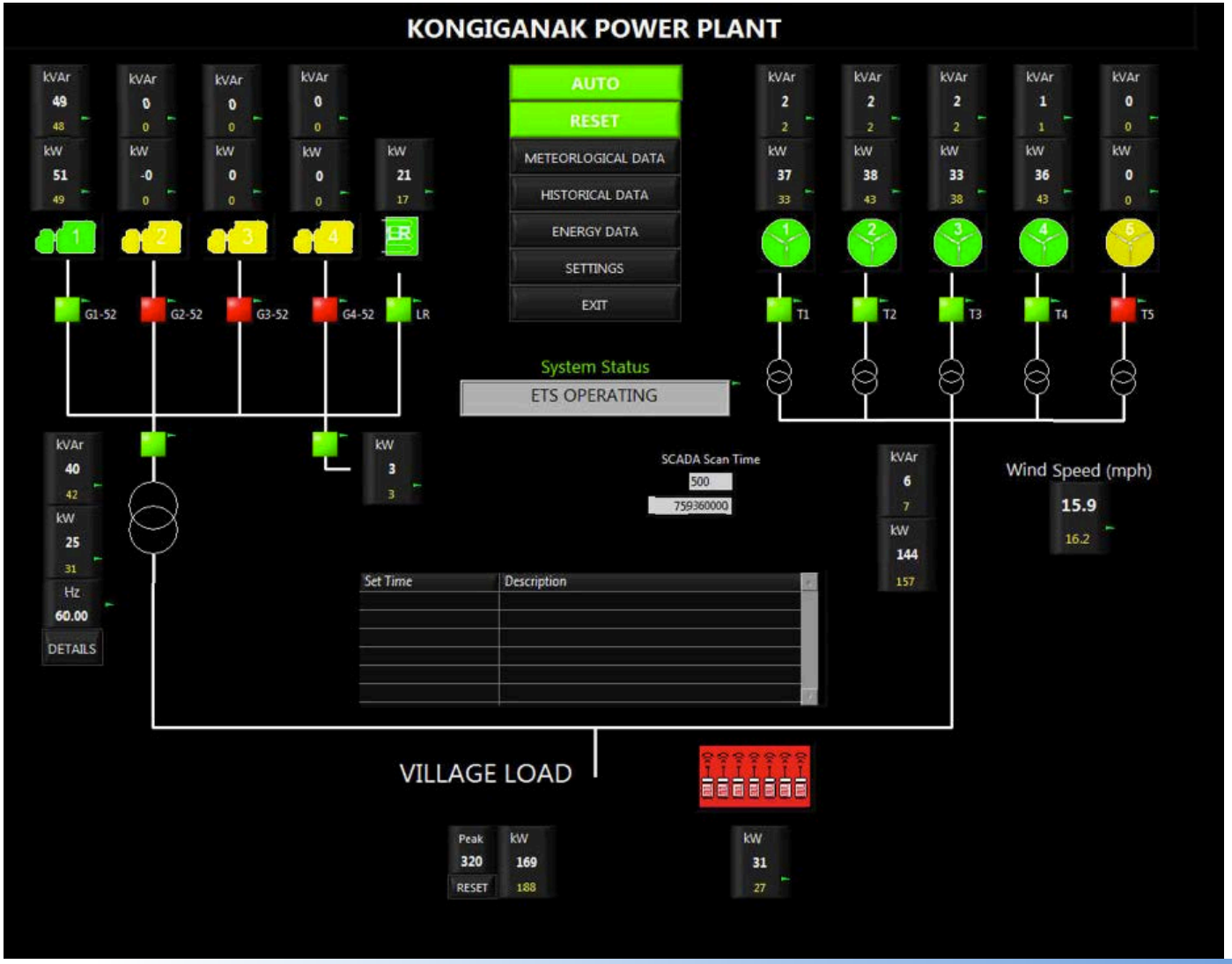
Chaninik Wind Group Wind Heat System SCADA



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Kongiganak Energy Summary 2013

KONGIGANAK POWER PLANT
Energy Summary (kWh)

2013	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Summary of Generation													
Diesel 1	42,370	320	1,100	22,020	17,640	380	29,830	62,540	2,730	23,180	89,790	91,340	**383,240**
Diesel 2	25,260	71,690	73,620	47,320	53,320	63,860	38,850	-	-	-	-	-	**373,920**
Diesel 3	-	-	-	780	-	-	-	20,810	75,720	59,830	-	-	**157,140**
Diesel 4	200	-	-	-	-	-	120	240	-	-	280	1,580	**2,420**
Total Diesel Generation	**67,830**	**72,010**	**74,720**	**70,120**	**70,960**	**64,240**	**68,800**	**83,590**	**78,450**	**83,010**	**90,070**	**92,920**	**916,720**
Wind Turbine 1	15,618	15,234	15,575	21,588	11,740	7,867	8,301	7,078	10,988	10,560	4,067	10,895	**139,512**
Wind Turbine 2	11,764	4,789	8,160	-10	-	1,396	736	2,919	10,670	13,439	14,341	11,381	**79,588**
Wind Turbine 3	26,130	18,936	22,211	20,113	15,733	12,018	9,678	8,921	5,854	15,038	14,444	11,510	**180,584**
Wind Turbine 4	23,363	5,139	-61	13,437	14,968	3,886	2,603	5,316	8,485	7,168	3,455	4,813	**92,571**
Wind Turbine 5	-	-	-	-	-	-	-	1,672	10,926	2,333	-62	-53	**14,816**
Total Wind Generation	**76,876**	**44,099**	**45,885**	**55,128**	**42,441**	**25,167**	**21,318**	**25,905**	**46,923**	**48,539**	**36,245**	**38,546**	**507,071**
Total Generation	**144,706**	**116,109**	**120,605**	**125,248**	**113,401**	**89,407**	**90,118**	**109,495**	**125,373**	**131,549**	**126,315**	**131,466**	**1,423,791**
Summary of Consumption													
Station Service	2,742	2,387	2,757	2,455	2,627	2,974	2,819	2,549	2,897	2,881	2,338	2,524	**31,950**
Wind to Village	40,487	28,254	31,072	33,362	23,518	14,383	14,593	16,640	29,355	33,375	23,380	25,480	**313,899**
Wind to Load Regulator	14,556	7,032	8,527	11,898	11,335	8,442	5,723	7,489	12,892	8,859	6,384	7,832	**110,969**
Wind to ETS	21,833	8,813	6,285	9,868	7,588	2,342	1,002	1,776	4,676	6,305	6,481	5,233	**82,203**
Total Village	**108,317**	**100,264**	**105,792**	**103,482**	**94,478**	**78,623**	**83,393**	**100,230**	**107,805**	**116,385**	**113,450**	**118,400**	**1,230,619**
Total Consumption	**144,706**	**116,109**	**120,605**	**125,248**	**113,401**	**89,407**	**90,118**	**109,495**	**125,373**	**131,549**	**126,315**	**131,466**	**1,423,791**
% Diesel kWh Displaced by Wind	**37.4%**	**28.2%**	**29.4%**	**32.2%**	**24.9%**	**18.3%**	**17.5%**	**16.6%**	**27.2%**	**28.7%**	**20.6%**	**21.5%**	**25.5%**

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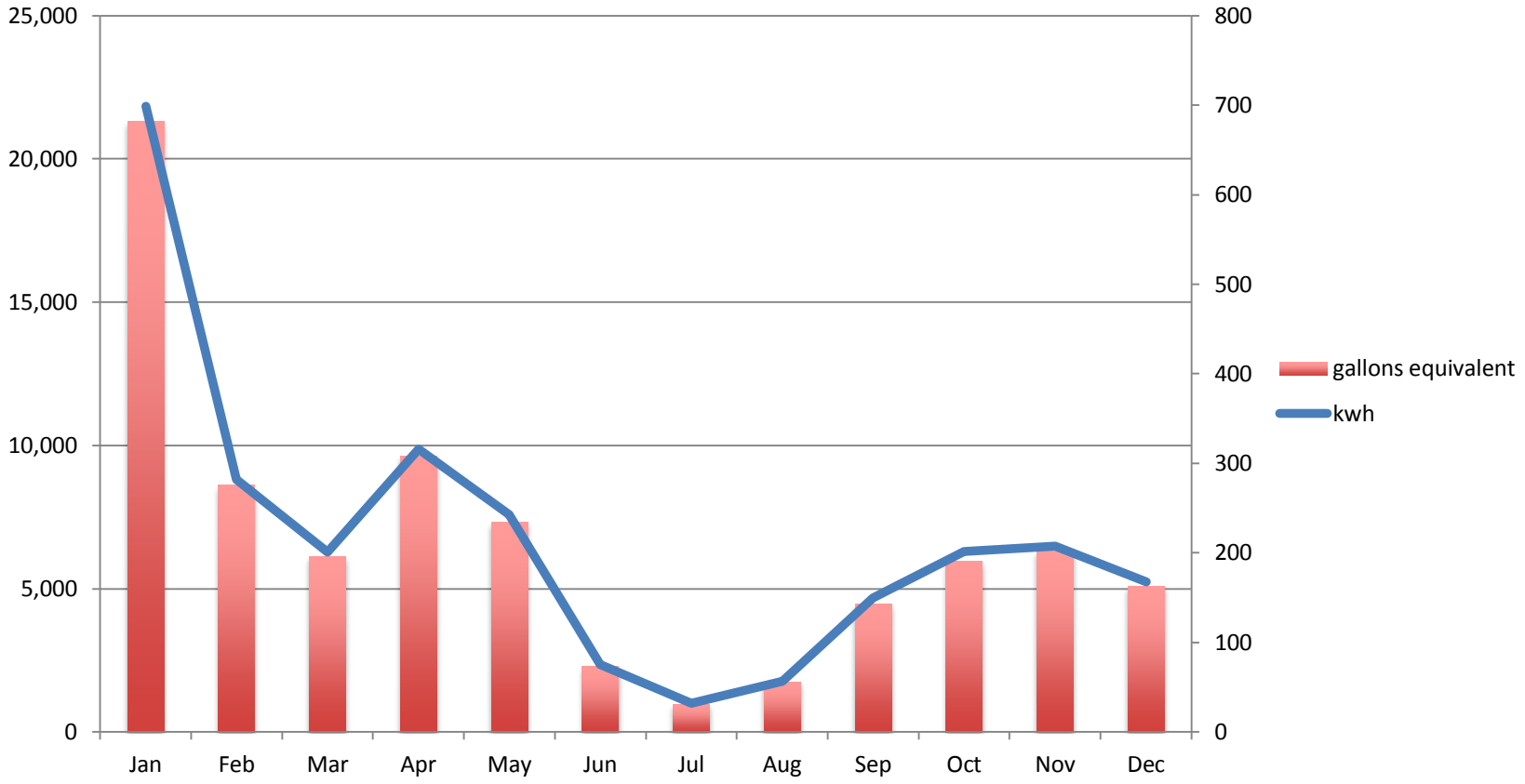
Example – Kongiganak ETS Fuel Displacement 2013



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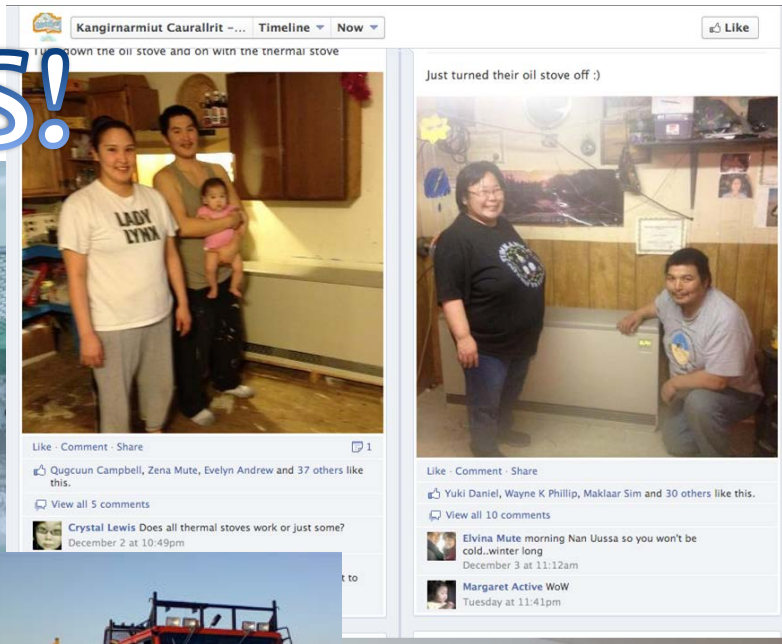
RESULTS!



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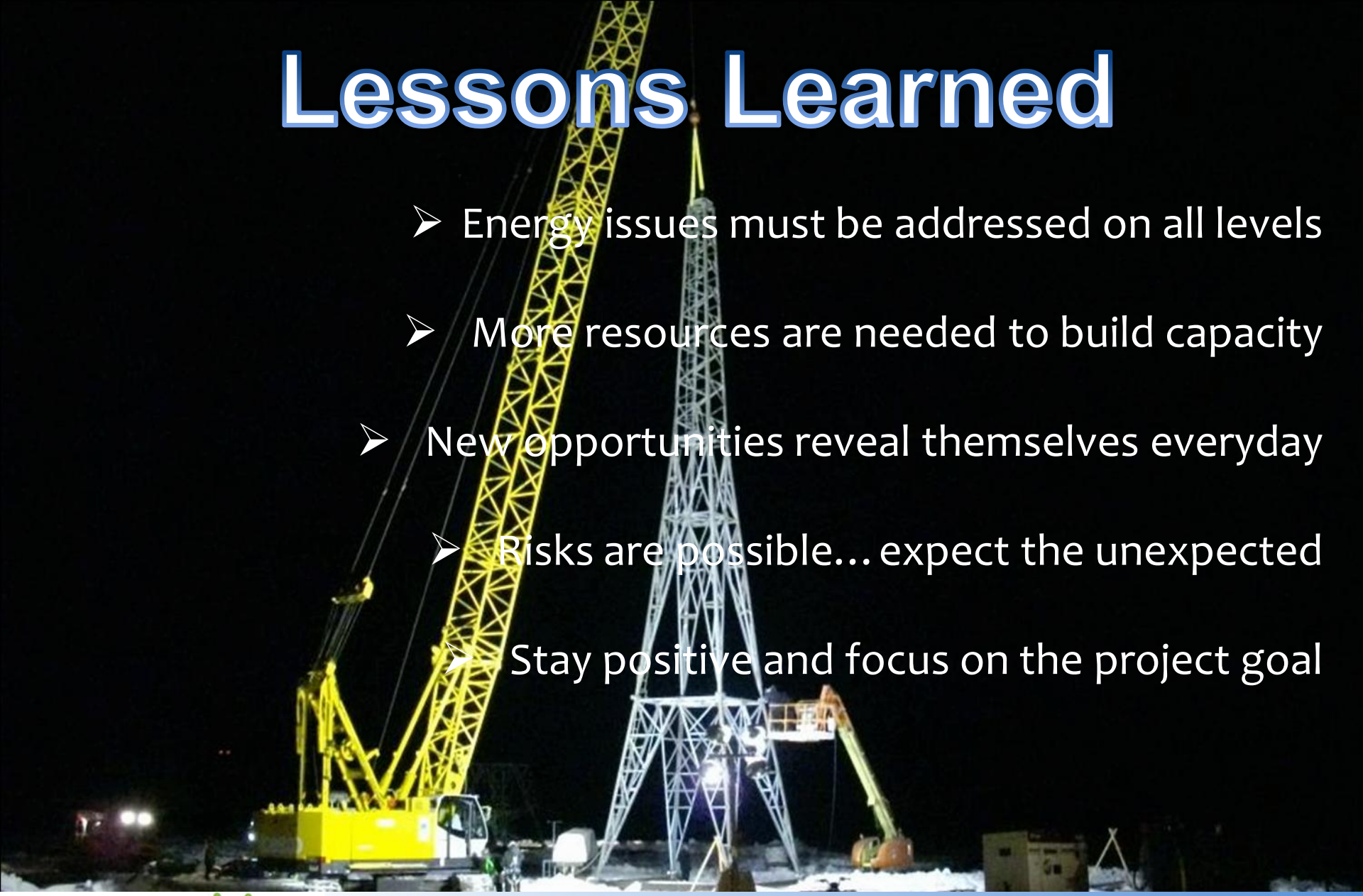
Lessons Learned



- Energy issues must be addressed on all levels
- More resources are needed to build capacity
- New opportunities reveal themselves everyday
- Risks are possible… expect the unexpected
- Stay positive and focus on the project goal

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Quyana cakneq!

Thank you very much!

Special Thanks To

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This work is possible because of your support.

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