

Wind and Solar Resource Assessment

David Schwarz



Inuvik Wind Project (NTPC)



Inuvik Satellite Station Facility (ISSF)
Solar Array

We respectfully acknowledge that Aurora College is situated on the traditional territories and homeland of the Dene, Inuit and Métis peoples of the Northwest Territories. We are grateful to the many Indigenous peoples of the NWT for allowing us the opportunity to learn, work and live on their lands. We are also deeply grateful for the generous sharing of Traditional Knowledge, wisdom and ways of knowing, being and doing with our students and employees.

Applied Energy Research Programs



- Build capacity for the measurement and analysis of wind and solar data.
- Provide decision makers with bankable wind and solar data.
- Advocate for the importance of wind and solar resource assessments.

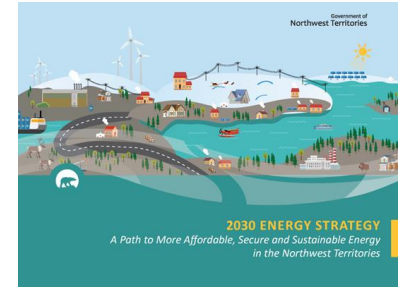
Inuvik High Point
60 m Meteorological Tower

Partners



Crown-Indigenous Relations and Northern Affairs Canada
Relations Couronne-Autochtones et Affaires du Nord Canada

Northern REACHE Program



Department of Infrastructure, Energy Division



Indigenous Communities



Industry



Local

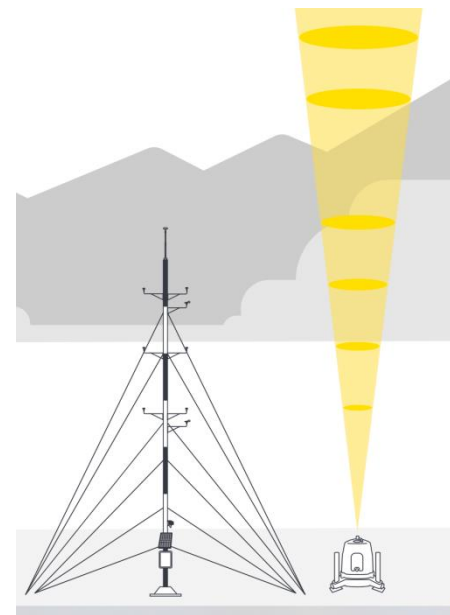


Research Institute
Institut de recherche

Wind Resource Assessment



Local long-term data
(Environment and Climate
Change Canada,
Tuktoyaktuk)



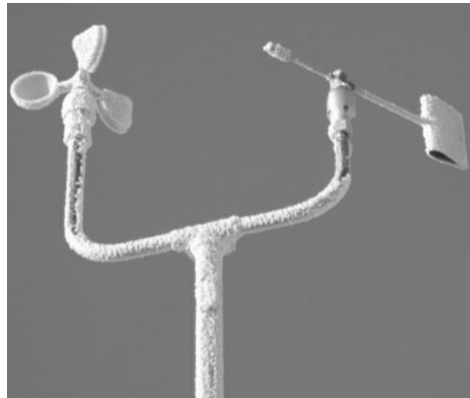
Site-specific
short-term data
(NRG Systems)



Wind Resource Monitoring Equipment

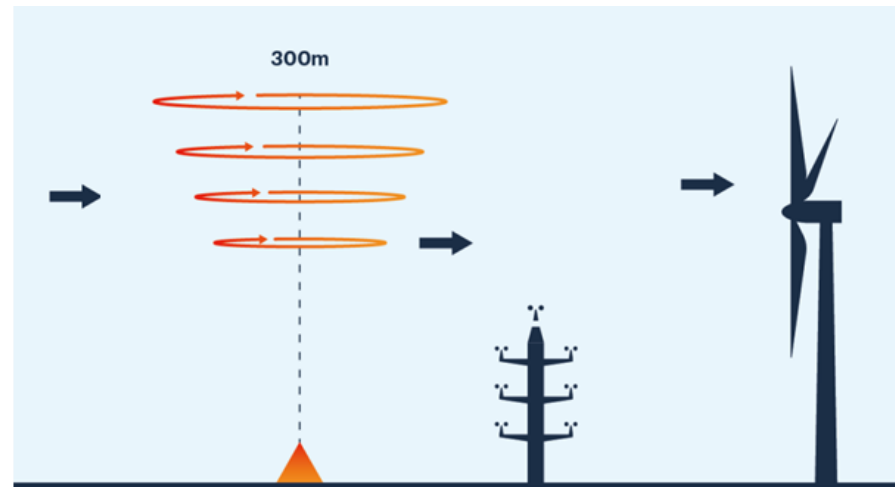
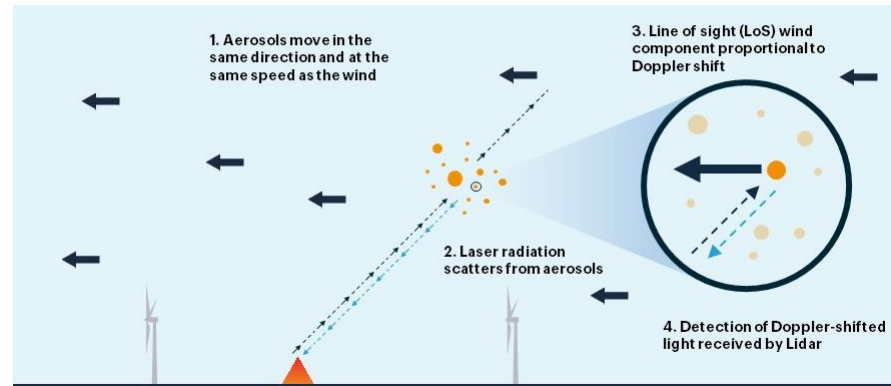


Meteorological Tower



Anemometer & Wind Vane

What is a wind Lidar?



ZX Lidars



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Research Institute
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Solar Resource Assessment

(Inuvik Solar Resource Assessment Monitoring Campaign)



Satellite-derived
long-term data
and site-specific
short-term data



Components of Solar Radiation

Direct radiation:
From the sun's disk itself (NASA)



Ground-reflected radiation:
“Sunglasses” (Canadian Museum of History)



Diffuse radiation:
Excluding the sun, scattered from the sky

shutterstock.com · 579495607

Solar Radiation Sensors (Pyranometers)



Global horizontal irradiance (GHI) and
Plane-of-array (POA) irradiance
(Hukseflux SR30)

Diffuse horizontal irradiance
(Delta-T SPN1)



Image courtesy of the U.S. Department of Energy

Wekweètì Wind and Solar Resource Assessment Monitoring Campaign



Fort McPherson and Tsiigehtchic Wind Resource Assessment Monitoring Campaign



Wind and Solar Resource Assessment Results

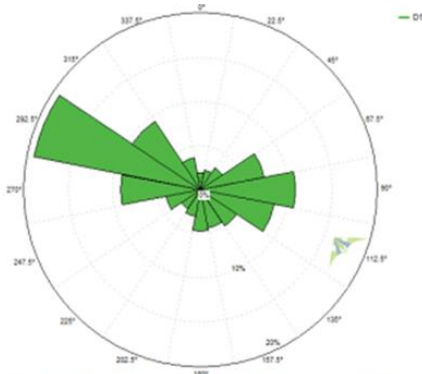


Figure 2-6 - Storm Hills measured data wind frequency rose - 1 full year

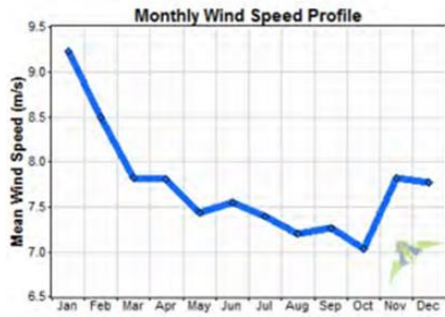


Figure 2-7 - Long term annual wind speed profile is winter-peaking

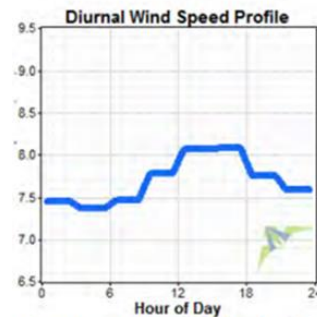


Figure 2-8 - Long term diurnal wind speed profile is afternoon-peaking



(Shutterstock)

Measured wind speed and direction data for Storm Hills

Results publicly available for future wind and solar energy developments

Thank You

Contact Details for More Information



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