

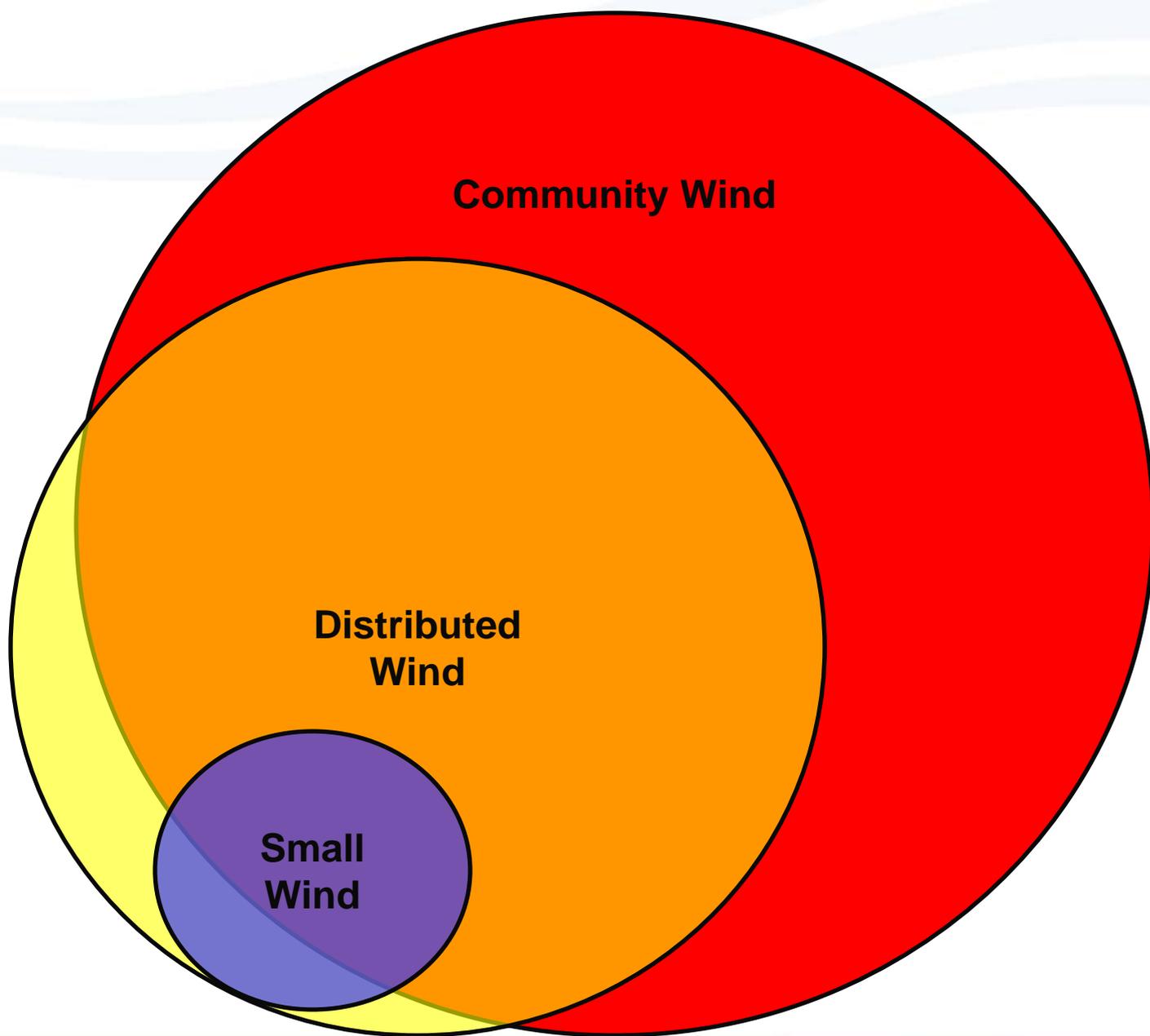


Community Wind: One Size Doesn't Fit All

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Community Wind

**Distributed
Wind**

**Small
Wind**



Photo: Doug Welch, January 2002

Community Wind Essentials

- Local ownership & control
- Project size depends on application & finances
- Ownership can be a public utility, local landowners, public or private facility, tax investors or combination
- Financial incentives usually required to make projects “pencil out”
- Local economic benefits are enhanced
- Electricity used locally
- Local champion normally the driver

Martha's Vineyard (MA)



Martha's Vineyard (MA)

- **Application:** Farm net-metering
- **Size:** One 50kW Endurance E-3120 on 36m monopole
- **Ownership structure:** Independent sheep farmer, Allen Farm.
- **Cost:** \$425k
- **Financing:** Massachusetts Clean Energy Center: \$100k grant based on turbine production; 30% federal tax credit; farm equity
- **Challenges:** Once installed, 51% of the energy produced must be used on the farm as a requirement for interconnection; initial permit was denied, later repealed and approved under a special agricultural exemption (“right to farm”).
- **Commission date:** December 2011
- **Motivation for project:** Owners wanted to make the family farm sustainable; wanted to reduce or eliminate their current electricity costs

Toksook Bay (AK)



Toksook Bay (AK)

- **Application:** Medium penetration wind-diesel village power system; 3 village-intertie in southwest AK
- **Size:** 4 x 100kW Northern Power turbines
- **Ownership structure:** AK Village Electric Cooperative
- **Cost:** \$4.4 million
- **Financing:** \$553k from AVEC; \$3.9M from various AK grants
- **Challenges:** Foundation design/installations in permafrost
- **Commission date:** 2006 (4th turbine in 2011)
- **Motivation for project:** Approx. 40% diesel savings (138,000 gal/year)
- <http://www.avec.org/communities/community.php?ID=4>

Hull Wind (MA)



Phase I

Photo credit: Hull Wind



Phase II

Photo credit: Dan Lampie

Hull Wind (MA)

- **Project Description:** 660 kW Vestas V-47 (Phase 1); 1.8 MW Vestas V-80 (Phase 2); 40kW in 1985 (at school)
- **Owner/operator:** Hull Municipal Light
- **Cost:** \$720k (phase 1; 2001); \$3.2 M (phase 2 ; 2006)
- **Financing:** HML rate stabilization fund; MA DOER \$\$ for feasibility
- **Other sources of generation:** nuclear, gas, coal: MA Muni Wholesale Electric Co. (MMWEC); wind supplies 10%+
- **Challenges:** community education (phase 1); brownfield foundation design/construction (phase 2); neighboring community
- **Motivation:** rate stability; homegrown energy
- **Community acceptance:** post installation survey: 95% favorable
- **Champion:** John McCloud, HML GM; Malcolm Brown & Andrew Stern, CARE
- **Reference:** <http://www.hullwind.org/>

Jiminy Peak (MA)



Jiminy Peak (MA)

- **Project Description:** 1.5 MW GE; Hancock, MA
- **Owner:** Jiminy Peak Mountain Resort
- **Developer:** SED
- **Commissioned:** 2007
- **Cost:** \$3.9 M
- **Off-takers:** Jiminy Peak (100%); originally, National Grid (50%)
- **Financing:** \$582 MTC grant; local bank debt
- **O&M:** GE
- **Challenges:** construction on mountain top; single turbine acquisition
- **Motivation:** economic (7 yr. payback; 67% of energy use), environmental impacts
- **Champion:** Brian Fairbank, Jiminy Peak CEO
- **Reference:** <http://www.jiminypeak.com/wind-turbine-faq>

Anheuser-Busch (CA)



Anheuser-Busch (CA)

- **Size:** One 1.5MW GE SLE turbine
- **Ownership:** 100% equity owned by Foundation Windpower
- **Off-taker:** Anheuser-Busch
- **Cost:** \$5.9 million
- **Financing:** Construction loan, Federal Investment Tax Credit, State of California Grant for Distributed Generation, Owner Equity
- **Challenges:** Local & CA state permitting process; high ground water table required changing foundation design, changing turbine location, re-permitting and re-titling project documents.
- **Commission date:** November 2011
- **Motivation for project:** Substantial energy cost savings by Anheuser-Busch over life of contract

Kodiak Project (AK)



Photo credit Dake Schmidt

Kodiak Project (AK)

- **Application:** wind-diesel-hydro isolated grid
- **Size:** 3 x 1.5MW GE turbines with 80m towers (4.5MW)
- **Ownership:** Kodiak Electric Association is the sole owner
- **Off-taker:** KEA is the user of the power
- **Cost:** \$21.4 million
- **Financing:** \$12 M, CREBs; \$5 M. state of AK grants; \$4.4 M, KEA
- **Challenges:** turbine supply (the first large ones in the state); getting construction equipment to the island; wind integration in operating on a small electric grid system
- **Commission date:** July 2009
- **Motivation for project:** 1 M gal diesel savings/yr.; lower cost of power; power price stability; reduced emissions

Berkshire Wind Power Co-op (MA)



Photo Source: www.berkshirewindcoop.org/Photos.html

Berkshire Wind Power Co-op (MA)

- **Project description:** 10, 1.5 MW GE turbines (largest wind project in MA); Brodie Mountain; 40% C.F.
- **Commissioned:** May, 2011
- **Ownership:** Berkshire Wind Power Cooperative Corporation (14 public power utilities + MMWEC JAA)
- **Cost:** \$64.7M (including 8 mi interconnection line)
- **Financing:** tax exempt, 20-yr municipal bonds (not CREBs); short term financing for turbine purchase and construction
- **Operations:** managed by MMWEC (also acquisition, development, construction, and financing)
- **Challenges:** financing; road permits; neighboring land development
- **Motivation:** rate stabilization; environmental benefits (not required by RPS)
- **Local benefits:** PILOT payments, green jobs, education programs, environment
- http://www.mmwec.org/documents/BWPCC_DedicationFactSheets_3.pdf

Junction Hilltop (IA)



Junction Hilltop (IA)

- **Size:** 7.5MW; 5 x 1.5MW GE SLE turbine
- **Ownership structure:** 2 local farmers + 7 relatives
- **Off-taker:** Alliant (IOU)
- **Cost:** \$16.5 M
- **Financing:** Treasury 1603 payment; New Market Tax Credit; State of Iowa loans
- **PPA value:** \$62/MWh
- **Challenges:** minimal (this is IA)
- **Commission date:** March 2012
- **Motivation for project:** income generation for farmers

Eastridge Project (MN)



Eastridge Project (MN)

- **Size:** 8 x 1.25MW Suzlon S-64s (10MW)
- **Ownership structure:** Minnesota flip
- **Off-taker:** Xcel Energy
- **Cost:** \$15 million
- **Financing:** 50/50 debt to equity. Local owners 1%, tax equity partner 99%, local bank debt pre-flip – 90% local, 10% tax equity post flip
- **PPA value:** approx. \$40/MWh plus MN state production incentive payment \$15/MWh
- **Challenges:** finding tax equity partner that is willing to share
- **Commission date:** March 2006
- **Motivation for project:** Local economic development using wind power

Lamar Piggyback Project (CO)



Lamar Piggyback Project (CO)

- **Size:** 4 x 1.5MW GE turbines (6MW)
- **Ownership structure:** Lamar Light and Power (LLP): 3 turbines;
Arkansas River Power Authority (ARPA): one turbine
- **Cost:** \$6 million
- **Financing:** LLP: 20 year bond issue for \$6 million
- **Challenges:** first piggyback project concept implemented
- **Commission date:** 2004
- **Motivation for project:** LLP and ARPA timed their project to coincide with the 162MW Colorado Green Project in order to lower turbine purchase price, development, construction and maintenance costs.

Community Wind Challenges

- Economics of scale
- Financing
- Inconsistent, short-term policies/incentives
- Normally can not utilize PTC
- Utility practices/PURPA
- Social acceptance



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