

XXIII CCFSNiES

Barcelona, 25 abril 2009

Projectes eòlics comunitaris



**Dr. Josep Puig,
Enginyer industrial**

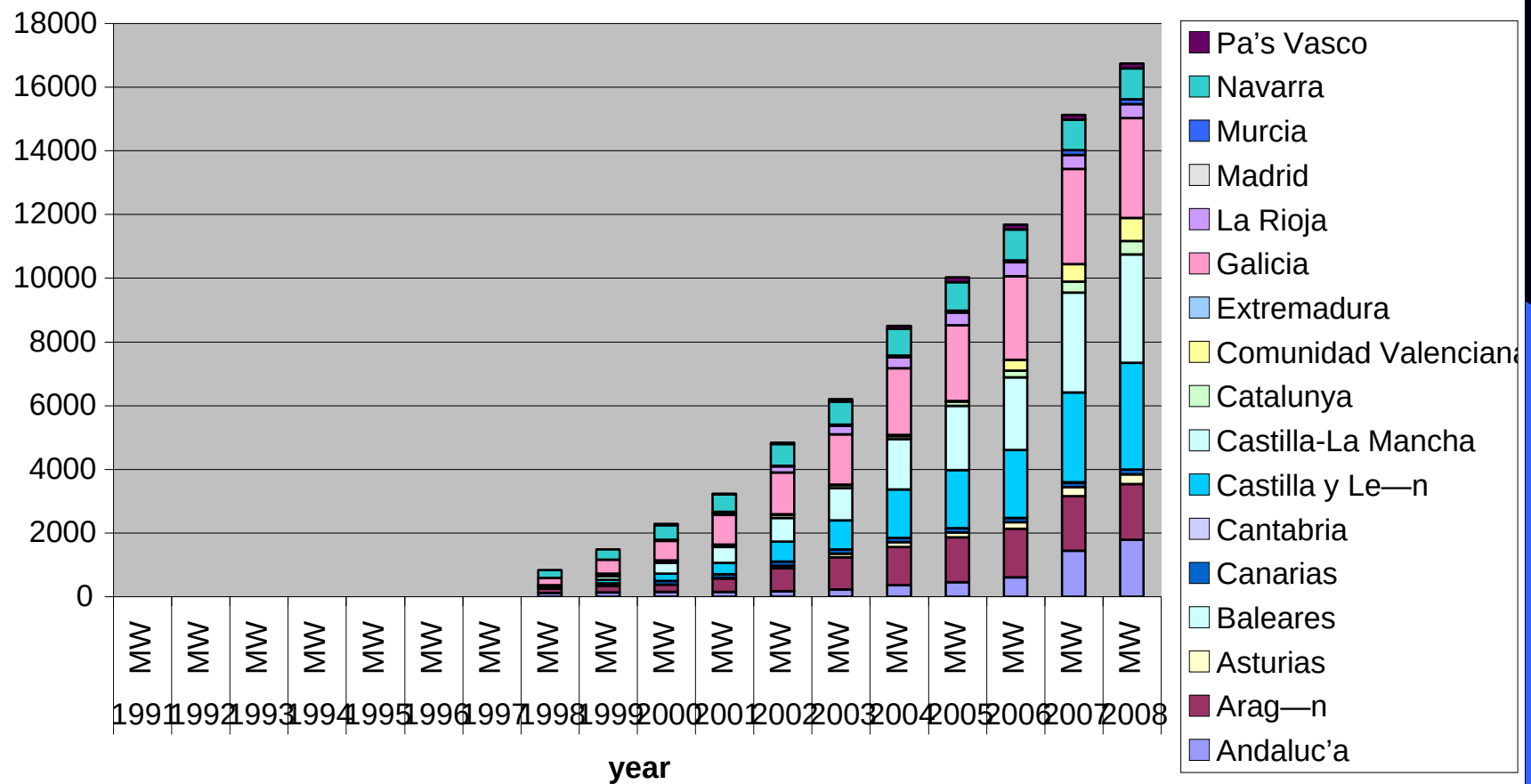


Contingut

- L'eòlica a l'Estat Espanyol
 - La història recent i els seus orígens
 - La pregunta
- Projectes comunitaris al món
- Una resposta a la pregunta
- El projecte 'Viure de l'aire del cel'

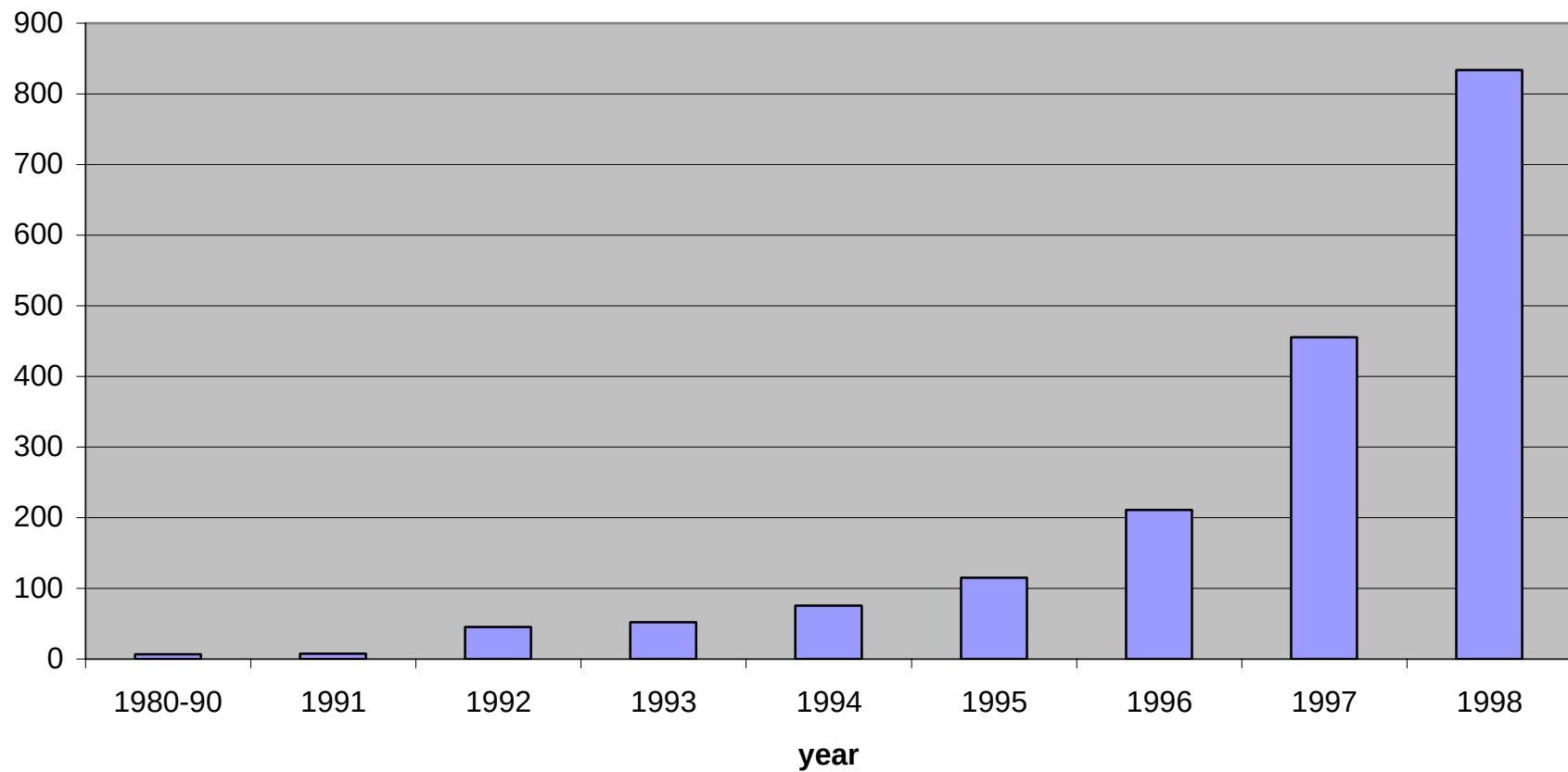
La història recent, Es

Wind Power Spain (1990-2008)



Els orígens, Es

Wind Power Spain (1990-1997)



Els orígens, Cat.

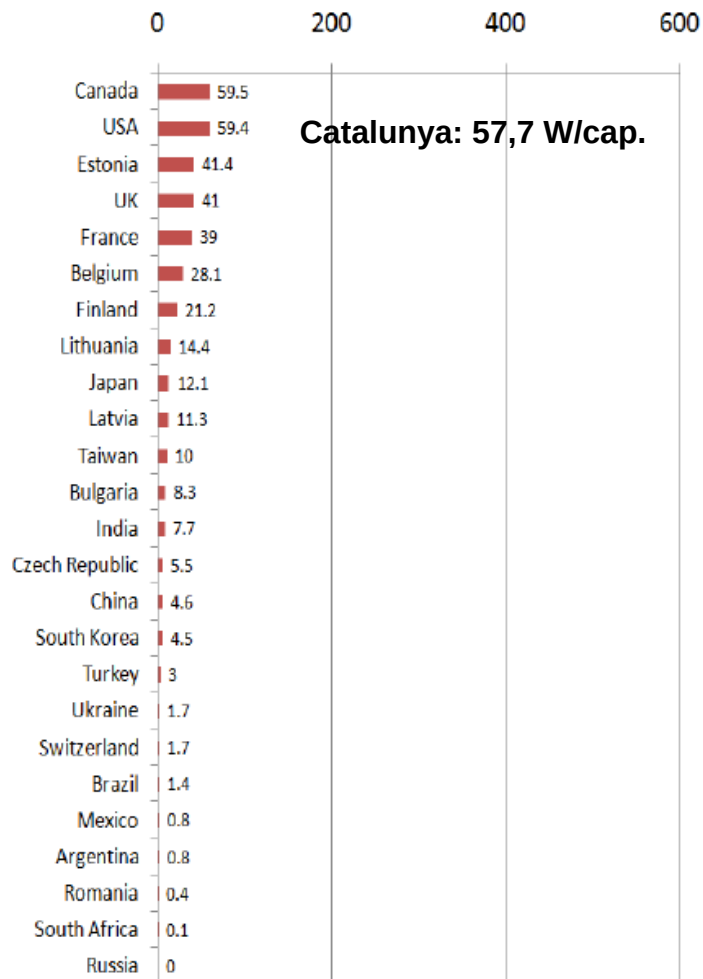
- Ecotècnia
 - Fundació: abril 1981
 - Primer prototipus: març 1984



La pregunta

- **Per què tenint l'eòlica el mateix marc promocional en totes les comunitats de l'Estat Espanyol, es dona la següent situació:**
 - 6 CA tenen més de 1.000 W/hab.
 - 2 CA tenen més de 200 W/hab.
 - 2 CA tenen més de 100 W/hab.
 - 3 CA tenen més de 50 W/hab.
 - 2 CA tenen entre 1 i 49 W/hab.
 - 4 CA tenen 0 W/hab.

wind power penetration in
W/capita: nations with nuclear
energy policy or weapons



wind power penetration in W/capita:
nations with legal nuclear fade-out
or moratorium

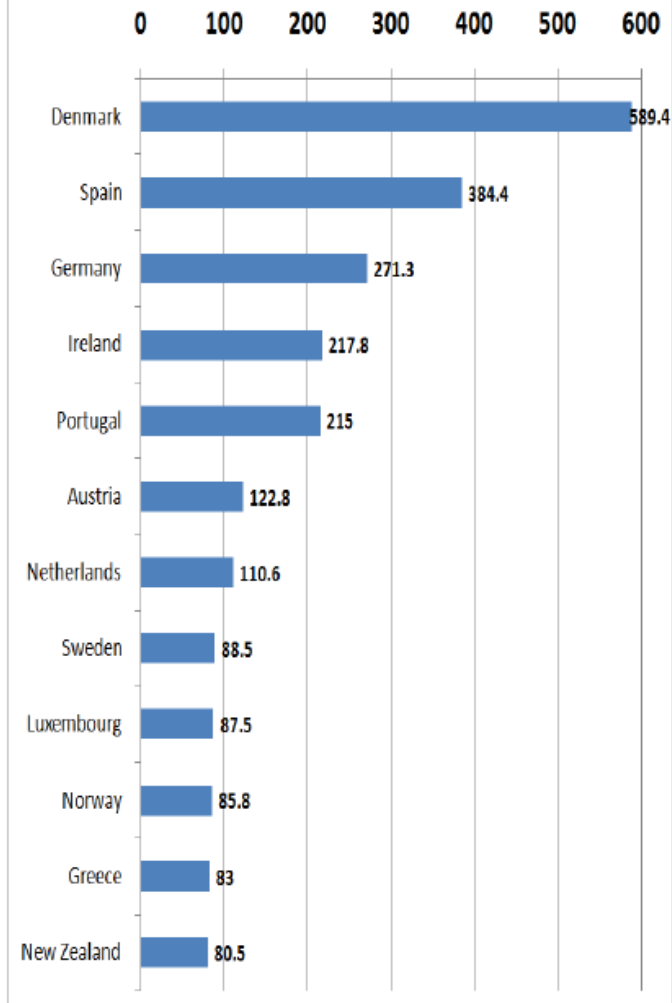


Figure 24 Wind penetrations per capita in nations with and without nuclear ambitions

Els orígens, EUA

CLEVELAND'S CONTRIBUTIONS TO WIN

THE WORLD'S FIRST WIND-DRIVEN ELECTRIC POWER PLANT
CLEVELAND, OHIO 1888-1908



Charles F. Brush
1857-1939

Conservationists and entrepreneurs in electrical engineering
founder of Brush Engineering, pioneering hydroelectric power
The Brush Engineering Company was founded in 1888 by the
Brush, Edison, and Thompson-Houston Electric Companies.



Wind turbine generator



The wind turbine generator designed and built by Brush which
supplied electricity to his museum and laboratory for 20 years.

In 1888 Charles F. Brush, a prominent Cleveland industrialist, secured
a large windmill on the water to generate electricity for his home
and laboratory. This was the first practical device to convert wind
energy to electric energy. The wind turbine generator was built until
1908. The tower remained until 1908 when the museum was demolished.
Brush made the first windmill installation on light towers and
power plants. The first windmill, Cleveland's Public House was destroyed
by Brush in 1891 in 1891 by one of the first instances of electric
power lighting in the world.

Wind turbine generator (brush turbine)

Technical Data

Dimensions	Capacity
Tower height	100 ft.
Hub diameter	10 ft.
Tip length	10 ft.
Total weight	10,000 lbs.
No. of blades	10

Capacity	Capacity
Full power capacity	10 kW
Hub speed	1000 rpm
Hub speed	100 - 1000 rpm

Brush Engineering Company

Brush Engineering Company

Brush Engineering Company

Brush Engineering Company

- 1888, Charles F. Brush va construir el primer aerogenerador a Cleveland, OH. Va funcionar fins el 1908.

Els orígens, Dk

- Dinamarca va començar a generar electricitat eòlica el 1892 quan Paul la Cour va construir un primer aerogenerador experimental i el 1897 un altre més gran a l'*Askov Folk High School*



Els orígens, Dk

- Dinamarca, s.XIX
 - 3.000 aeromotors i aerogeneradors en la indústria i > 30.000 en granges (>200 MW),

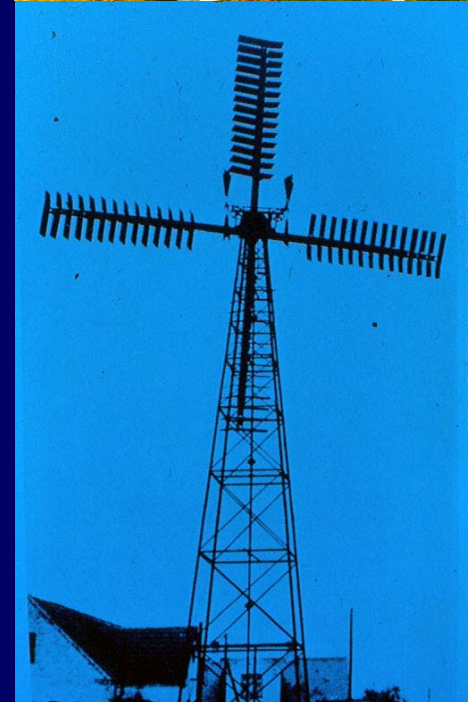


Els orígens, Dk

- 1903: fundació de l'Associación Danesa de Producció d'Electricitat amb el Vent (*Dansk Vind Elektricitets-Selskab – DVES*)
 - Publica fins el 1915 el Diari de l'electricitat mitjançant el vent (*Tidsskrift for Vindelektricitet*)
 - Va projectar 27 estacions de producció eòlica d'entre 5 i 25 kW

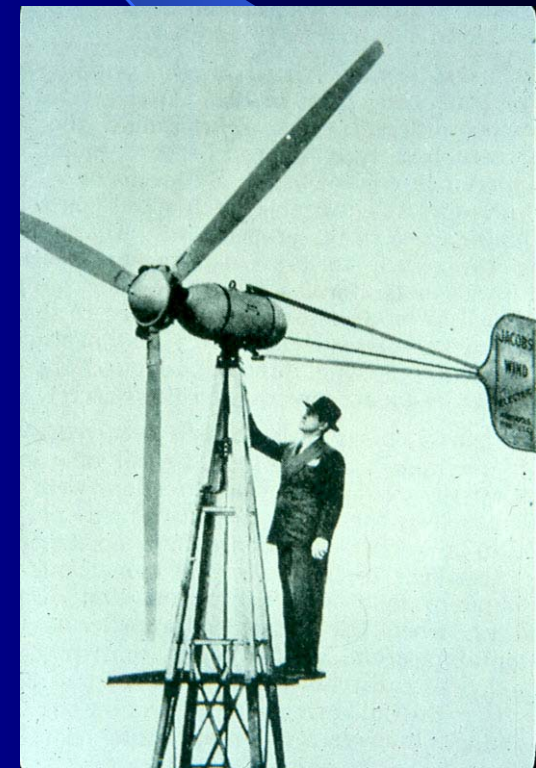
Les primeres passes, Dk

- Primeres empreses eòliques
 - 1910-1925. P.Vinding va dissenyar les màquines Agricco (5 pales, diàmetre 11 m., 15 kW) que va comercialitzar l'empresa Larsen
 - 1930. L'empresa Lykkegard comercialitza els populars 'Aurora' (4 pales, 30 kW)



Els pioners, EUA

- 1931. Marcellus Jacobs va fundar la *Jacobs Wind Electric Company*.



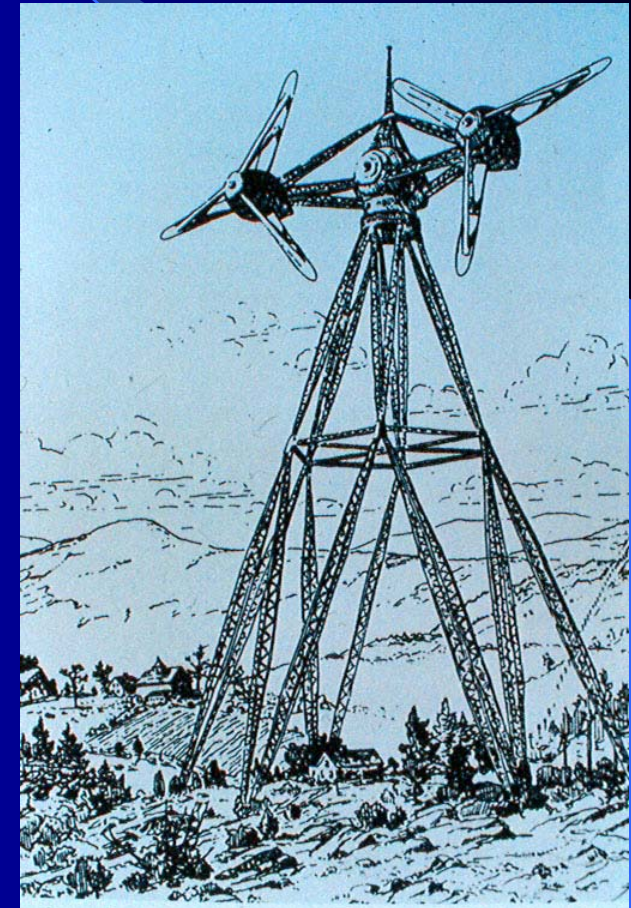
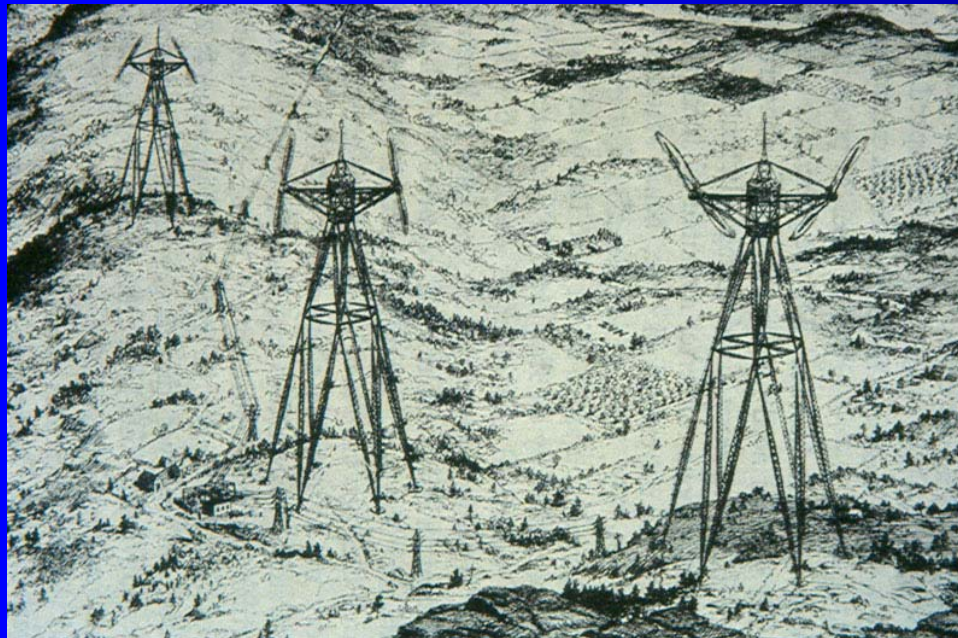
Els pioners, URSS

- 1931. Primer aerogenerador connectat a la xarxa a Balaklava (Crimea)
 - 100 kW (10,5 m/s)
 - Pales d'11 m.
 - > 200.000 kWh/any
 - Destruit pels nazis
- 1933. Primera conferència sobre l'ús de l'energia eòlica



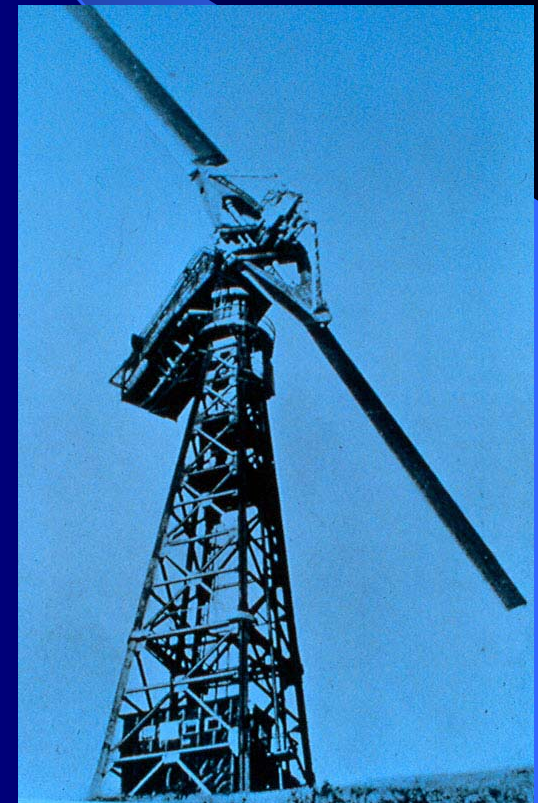
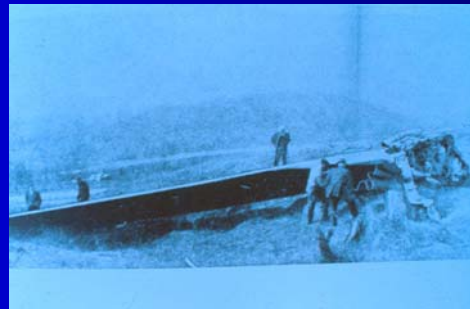
Els pioners, Alemanya

- 1933. Honnef fa públic el seu gegantí projecte



Els pioners, EUA

- Aerogenerador Smith-Putnam, 1941-1943
 - Grandpa's Know (Vermont)
 - 1.250 kW



Els pioners, EUA

- Una profecia?
 - “Aquest aerogenerador ha demostrat que en un futur no llunyà es podrà enlluminar les cases i es podrà utilitzar en les fèbriques l’energia produïda pels sistemes convertidors d’energia eòlica”

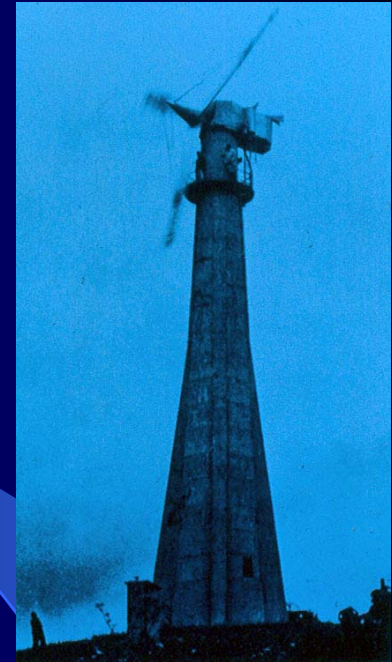
Dr. Vanevar Bush, decano del MIT

(Font: Putnam, P.C. (1948), Power from the Wind, Van Nostrand Reinhold)

La necessitat, Dk

- Vulnerabilitat energètica

- Estalla la 2^a guerra mundial. Escasesa de petroli.
- 1940-1941. Els generadors d'electricitat es llencen pel camí eòlic
- 1942. Aerogenerador de 70 kW, F.L.S. Aermotor a Gedser (illa de Falster). Va funcionar fins 1958.
- 1943. 78 aerogeneradors en funcionament (la majoria Lykkegard, però 12 F.L.S. Aermotor)
- L'aerogenerador d'Askov va funcionar fins 1960
- Entre 1940 i 1947 es van generar 18,6 GWh a Dk



La necessitat, Dk

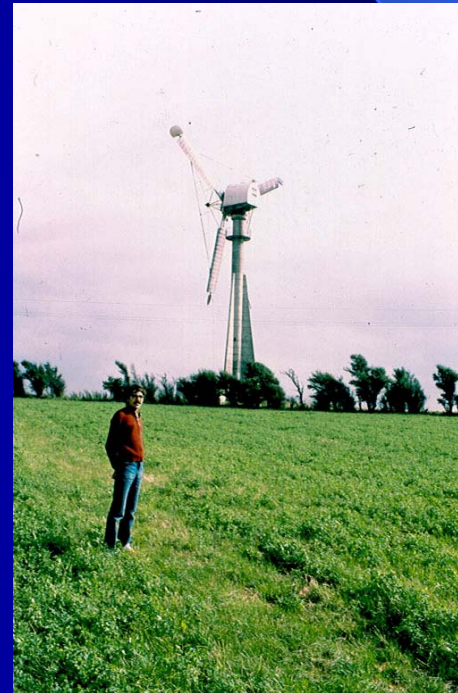
- 1947. J. Juul (alumne de Paul la Cour)
 - inicia investigacions en el Laboratoro d'Electricitat del Sur de Jutlàndia (*Sydostsjaellands Electricitets Aktieselskab – SEAS*) sobre la viabilitat d'utilitzar energia eòlica per generar electricitat.
 - SEAS subministrava energia a les illes de Zealand, Falster i Lolland.
 - Aerogeneradors a Vester Egesborg i Bogo

La maduresa, Dk

- 1950's. Associació Danesa de Treballs Elèctrics (*Danske Elevearkers Forening – DEF*) i SEAS creen un Comité d'Energia Eòlica
- El govern danès concedeix una subvenció de 300.000 DKr per a la construcció d'un aerogenerador de major potència

La maduresa, Dk

- 1957. Aerogenerador Gedser
 - 200 kW, màxima producció 367.000 kWh/any₁₉₆₇
 - Va funcionar de 1958 a 1967
 - 2.242.000 kWh



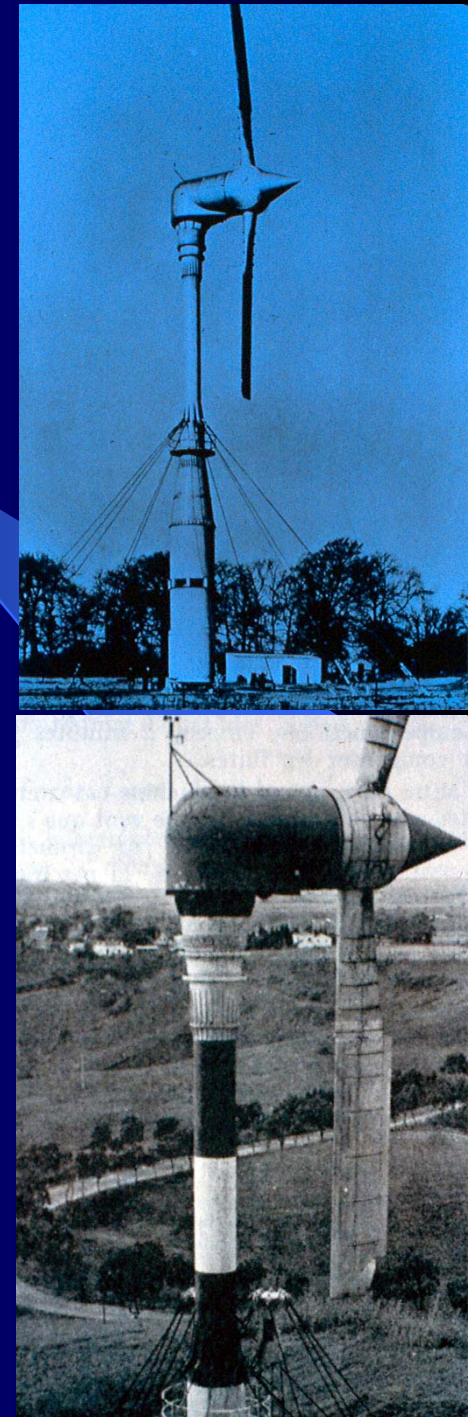
La maduresa, UK

- 1949. *NSHEB* signa contracte amb *John Brown and Co.Ltd.* per dissenyar i construir un aerogenerador de 100 kW automàtic
- 1951-1952.
Construcció prototipus



La maduresa, UK

- L'Autoritat Anglesa d'Electricitat (*British Electricity Authority – BEA*) s'interessa per la generació eòlica d'electricitat
 - Decideixen apostar per la tecnologia de pales a depressió de J. Andreau
 - Enfield Cables Ltd. Va instal·lar el prototipus de 100 kW a Prae-Wood, St. Albans, Hertfordshire
 - 1957. Passa a mans d'*Electricité et Gas d'Algerie*



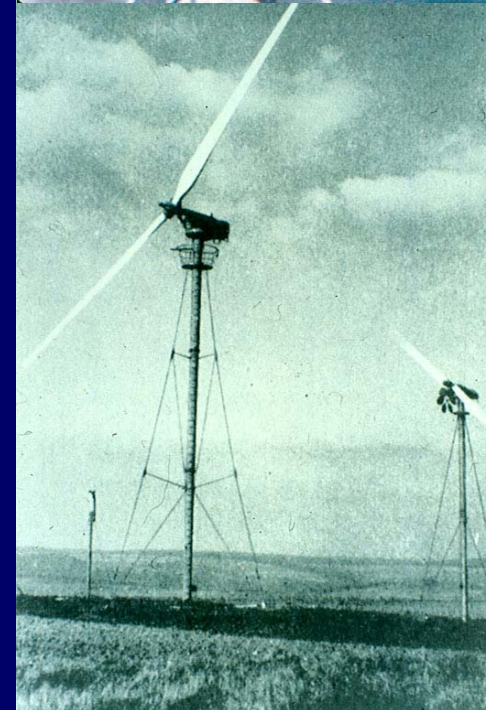
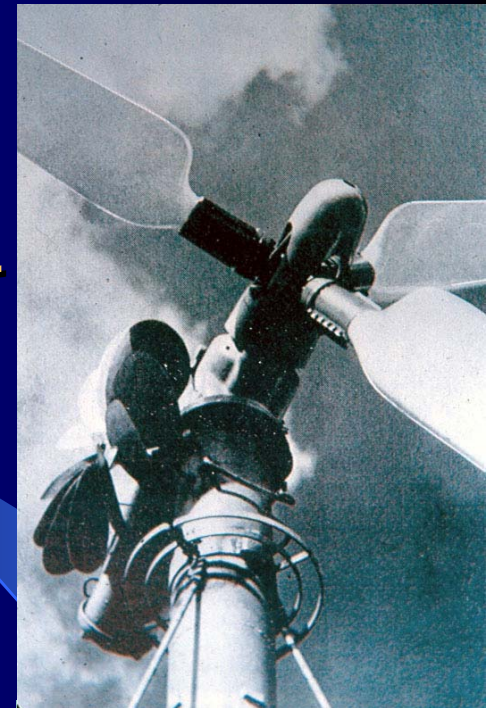
La maduresa, Fr

- La Divisió d'Energia Eòlica d'EDF, sota la direcció de M.A. Argand va experimentar (1948-1966) amb 3 màquines eòliques de gran potència
 - Best-Romani, 800 kW
 - Neyrpic, 132 i 1.000 kW



La maduresa, Alemanya

- El Prof. Ulrich Hutter de la Universitat de Stuttgart va dirigir, entre 1950 i 1960, un ambicios programa eòlico.
 - Prototipuss de 10 fins a 100 kW



L'eclosió, Dk

- 1974. Les escoles Tvind es plantegen que fer davant la crisi del petroli
 - 1975. Comencen les obres
 - 1978. Comença a funcionar
 - 900 kW



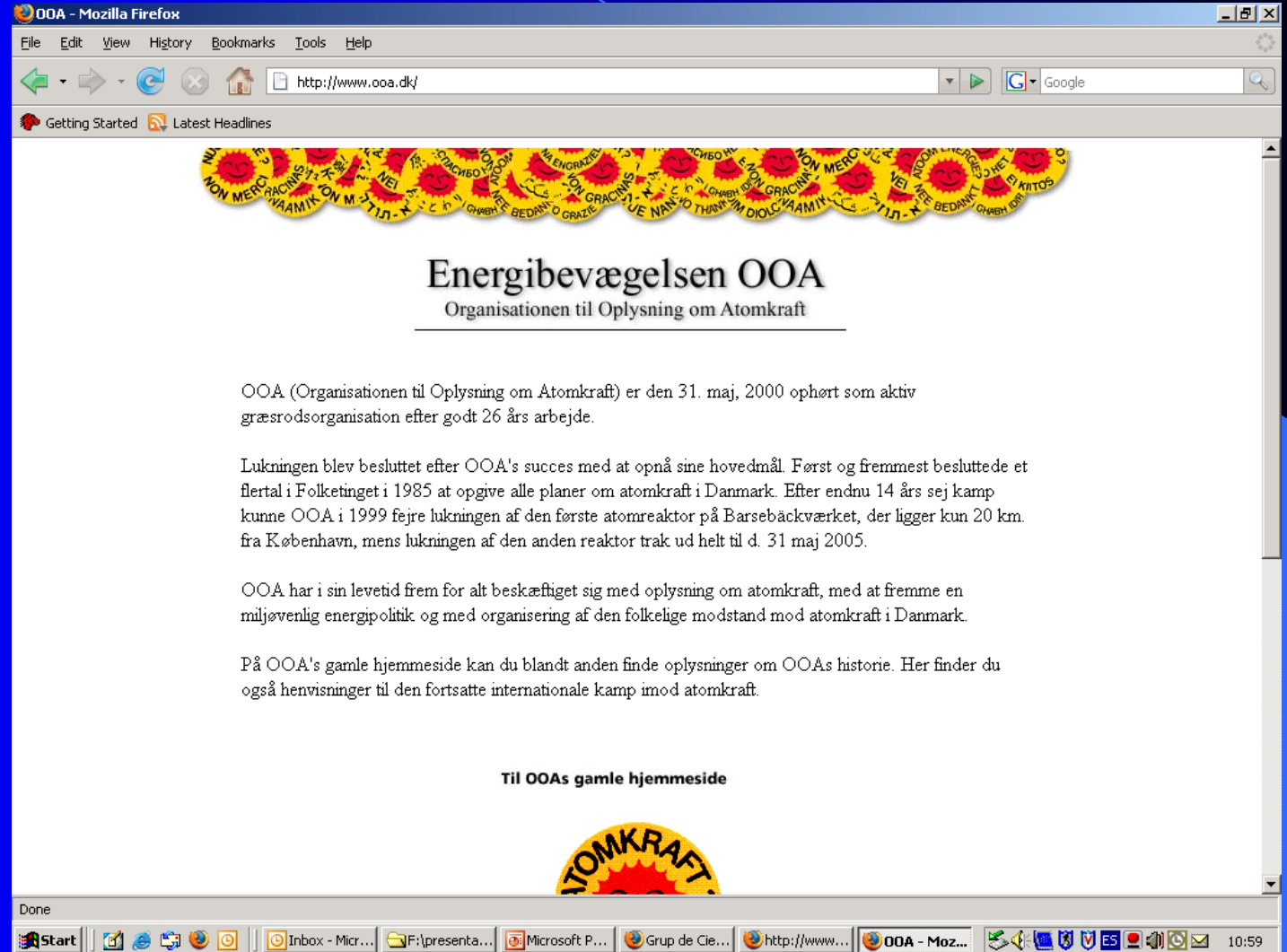
Tvind avui



El poder de la gent

OOA

1977-2000



Un govern sensible

- El Parlament danès decideix no iniciar un programa nuclear

OOA

Organisationen til Oplysning om Atomkraft
Ryesgade 19
DK - 2200 København N
☎ 01-35 55 07 & 01-35 48 07

NUCLEAR POWER STOPPED IN DENMARK

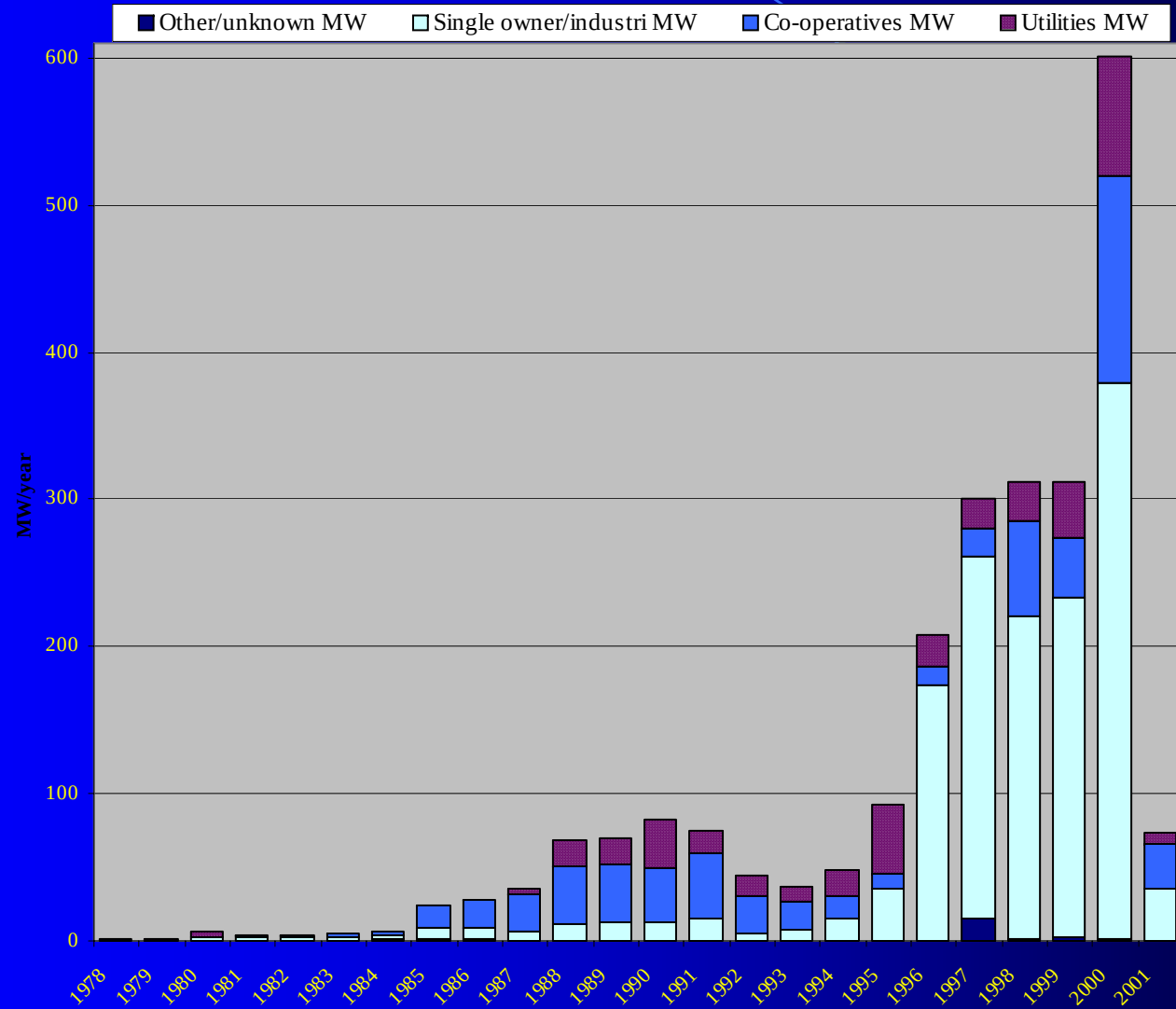
On 29 March 1985, the Danish Parliament voted to approve the following statement:

"The Parliament directs the government to adjust the official energy plans to meet the condition that nuclear power will not be used."

On 20 April 1985, the Parliament approved the following decision:

"The Parliament directs the government to free the 15 areas reserved for the construction of nuclear power plants before the 1 September 1985".

La propietat Dk



Projectes comunitaris, Dk

Middelgrunden, Dk



MIDDELGRUNDEN WIND TURBINE CO-OPERATIVE

Cooperative Economy Production News Articles Project info Photo Contact/visit Links/sitemap 



The English section of this website will not be updated in general after 1. january 2004.

Please go to [Danish section](#) or contact [the Cooperative](#)

See [production figures](#)

NEW [Cracks in Siemens Geafol transformers report](#) NEW



You are visitor nr.: **184420** since 01.03.03

Projectes comunitaris, UK

Community Windpower Ltd - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.communitywindpower.co.uk/index.asp

Getting Started Latest Headlines



community windpower

- Introduction
- About us
- Environmental Policy
- Community benefits
- Climate change
- Wind energy
- Developing windfarms
- Projects
- Children's windy world
- Media centre
- Careers
- Useful links
- Find us
- Contact us



Latest News...

MAN-MADE CLIMATE CHANGE

A new study demonstrates with virtual certainty that climate change observed over the last four decades is man-made and not the result of natural climate variations.

The findings confirm the conclusion of the Intergovernmental Panel on Climate Change (IPCC) fourth assessment report published in 2007 that human action was changing the climate.

Scientists behind the study published in the journal ... [more](#)



Dalry Windfarm Webcam

Username: [guest](#)
Password: [password](#)

[To Install latest java applet click here](#)

© 2008 Community Windpower Ltd | [Privacy policy](#)

Projectes comunitaris UK

http://www.energy4all.co.uk/energy_home.asp



[Home](#) [About Us](#) [Community Ownership](#) [Projects](#) [Scotland](#) [News](#) [Links](#) [Contact Us](#)

Latest News

28/05/2008
New Co-operative to Develop Wind Energy Project Near Market Harborough
Energy4All, the UK's leading social enterprise promoting community ownership of renewable energy, is proposing to develop, in partnership with the local community and landowner, a wind energy project on land to the west of Market Harborough.

[Read More >>>](#)

Welcome to Energy4All

Delivering community-Owned Green Power

Energy4All is the UK's leading expert in community - owned renewable energy schemes.



Register Your Interest Here



Energy4All Scotland

[Visit the Site](#)



Supported by:
The co-operative fund

Energy4All Delivering Community-Owned Green Power

Westmill AGM & Grand Opening a Huge Success!!

Over 600 members and guests attended the open day of Westmill wind farm on Saturday 3rd May. Jonathon Porritt, Chair of the Sustainable Development Commission, officially opened the ceremony.

For more information on the open day please [Click here](#)

Regional Developers/Managers position now closed, please click here for an update

Energy4All is the UK's leading expert in community-owned renewable energy schemes.

Energy4All encourages people from all walks of life to be part of the renewable revolution and join in the fight against climate change, whilst maximising the social, economic, and environmental benefits of schemes to the community.

Energy4All is run by a dedicated team promoting the highly successful asset-ownership model pioneered by the award winning Baywind Energy Co-operative Ltd.

Projectes comunitaris UK

[Home](#) [About Us](#) [Community Ownership](#) [Projects](#) [Scotland](#) [News](#) [Links](#) [Contact Us](#)

Projects

Baywind

Baywind movie

Westmill Wind Farm Co-op

Findhorn

Fenland Green Power Co-operative

Boyndie Co-operative

Baydon Meadow

Airfield Wind Farm

Scotland Portfolio

Reeves Hill Wind Farm

Isle of Skye Renewables Co-operative

Garth Wind Power Co-operative

Projects

Click on a wind turbine to learn more about that project.

Mapa

Satèl·lit

Híbrid

POWERED BY Google

La imatge és ©2008 TerraMetrics - [Condicions d'ús](#)

Projectes comunitaris, UK



[Home](#) [About Us](#) [Community Ownership](#) [Projects](#) [Scotland](#) [News](#) [Links](#) [Contact Us](#)

[Projects](#)
[Baywind](#)
[Baywind movie](#)
[Westmill Wind Farm Co-op](#)
[Findhorn](#)
[Fenland Green Power Co-operative](#)
[Boyndie Co-operative](#)
[Baydon Meadow](#)
[Airfield Wind Farm](#)
[Scotland Portfolio](#)
[Reeves Hill Wind Farm](#)
[Isle of Skye Renewables Co-operative](#)
[Gartree Wind Power Co-operative](#)

Baywind

Background

Baywind Energy Co-operative Ltd, an Industrial & Provident Society, was formed in 1996 to allow a community in Cumbria to invest in a local wind farm. The original board of directors included 7 members of the community from Ulverston and Barrow.

Baywind's aim is to promote the generation of renewable energy and energy conservation.

The first share offer in 1996/97 raised £1.2 million to buy two turbines at the Harlock Hill wind farm. In 1998/99 the second share offer raised a further £670,000 to buy one turbine at the Haverigg II wind farm site. Preference was shown for local investors, so that the community shares the economic benefits from their local wind farm. Around 40% of existing Baywind shareholders live either in Cumbria or North Lancashire with a wider number from the Northwest Region.



How Does it work?

A co-operative society operates much like a traditional limited company except that the voting rights are distributed equally amongst the members, regardless of the number of shares held. Baywind has a minimum share holding of £300 and a maximum (by law) of £20,000. Hence a stake in the co-op is within easy reach of



[Home](#) [About Us](#) [Community Ownership](#) [Projects](#) [Scotland](#) [News](#) [Links](#) [Contact Us](#)

[Projects](#)
[Baywind](#)
[Baywind movie](#)
[Westmill Wind Farm Co-op](#)
[Findhorn](#)
[Fenland Green Power Co-operative](#)
[Boyndie Co-operative](#)
[Baydon Meadow](#)
[Airfield Wind Farm](#)
[Scotland Portfolio](#)
[Reeves Hill Wind Farm](#)
[Isle of Skye Renewables Co-operative](#)
[Gartree Wind Power Co-operative](#)

Westmill Wind Farm Co-operative Ltd

The first wind farm in the south-east of England - 100% Community Owned

Westmill Wind Farm Co-operative Ltd, which was established in 2004 to build the first wind farm in the south-east of England has given people an opportunity to invest in a greener future by buying a share in the unique project.



The wind farm, which has planning permission on a former airfield in Watchfield, South Oxfordshire, is one of the first 100 per cent community-owned wind farms in the UK.

The co-operative has financed the purchase and construction of five 1.3 MW wind turbines through a £3.7m fundraising campaign that saw the public able to buy shares in the project. The turbines are expected to become operational in March/April 2008 and will provide enough 'green' electricity to power more than 2,500 average homes.

Shares in the wind farm went on sale during November 2005 and were available to anyone across the UK. Each share is worth £1. The minimum investment is £250 and the maximum is £20,000. People living within a 50 mile radius of the site were given priority as the scheme was over-subscribed.

Each investor will receive an annual interest payment from trading surpluses, investors will be eligible for tax relief from the Government's Enterprise Investment Scheme and the original investment will be returned at the end of the 25-year scheme.

The wind farm is the brainchild of the landowner - organic farmer

Projectes comunitaris, UK



[Home](#) [About Us](#) [Community Ownership](#) [Projects](#) [Scotland](#) [News](#) [Links](#) [Contact Us](#)

Projects

- Baywind
- Baywind movie
- Westmill Wind Farm Co-op
- Findhorn
- Fenland Green Power Co-operative
- Boyndie Co-operative
- Baydon Meadow
- Airfield Wind Farm
- Scotland Portfolio
- Reeves Hill Wind Farm
- Isle of Skye Renewables Co-operative
- Gartree Wind Power Co-operative

Findhorn

Findhorn Eco Village, Moray

A Windfarm development which has provided enough electricity to meet the needs of the Findhorn Foundation's 250 residents has been completed. Construction of the £600,000 project at the Moray eco-village community began in November, when three second-hand turbines from Denmark arrived.

They are now in place and where commissioned in January 2006. Moray Council's environmental services committee approved the windfarm plans by Findhorn Windpark Ltd January 2005.

The 225kW turbines, each about 150ft high, are situated next to the community's existing turbine, which was built more than 15 years ago on a site near RAF Kinloss at Duneland. The foundation attracts about 4,000 visitors annually, and power from the single turbine has produced about 10% of the community's needs.

Combined, the small-scale windfarm produces between 75% and 100% of the electricity used at the Findhorn Foundation.





[Home](#) [About Us](#) [Community Ownership](#) [Projects](#) [Scotland](#) [News](#) [Links](#) [Contact Us](#)

Projects

- Baywind
- Baywind movie
- Westmill Wind Farm Co-op
- Findhorn
- Fenland Green Power Co-operative
- Boyndie Co-operative
- Baydon Meadow
- Airfield Wind Farm
- Scotland Portfolio
- Reeves Hill Wind Farm
- Isle of Skye Renewables Co-operative
- Gartree Wind Power Co-operative

Boyndie Co-operative

Boyndie Wind Farm Co-operative ~ the First Wind Farm Co-operative for Scotland



The seven turbine project at Boyndie airfield is the first scheme in the Scotland portfolio to obtain a green light and was approved in January 2004 by Aberdeenshire Council's Banff and Buchan Area Committee. Work on the Boyndie wind farm started in June 2005 and represents an investment of £10-15 million. The 2 MW Ennercon turbines will generate enough clean, green energy to supply around 8,500 homes and stand at a height of 100m to tip. Local firm Morrisons have finished building the wind farm in conjunction with Ennercon.

Boyndie Wind Farm Co-op, www.boyndie.coop was established in 2005 to purchase a share of the wind farm. Five local residents have joined the board and have successfully completed the share launch, raising the target of £730,000.00. Profits from the sale of the green electricity produced are distributed to members through an annual payment. Preference for joining the scheme is given to people living in the area to maximise the economic benefits to the local communities around the Boyndie development.

Falck Renewables, a wind energy subsidiary of the Falck Group, is developing over 300MW of wind projects with RDC Scotland Limited (RDC) utilising the resources of West Coast Energy. For further information on these projects please visit www.wind4energy.co.uk

Projectes comunitaris, NA

Community Wind & Wind Energy and the Environment by Paul Gipe - Mozilla Firefox

Fitxer Edita Visualitza Historial Adreces d'interès Eines Ajuda

http://www.wind-works.org/articles/community.html

Wind-Works.org

by Paul Gipe

Home Books **Articles** Workshops Photos Biography

Books

- Wind Power
- Wind Energy
- Wind Basics
- Wind in View

Articles

- Large Wind
- Small Wind
- Co-op Wind**
- Feed Laws
- Solar Energy
- Other
- En français

Wulf Field

Workshops

Photos

Biography

Contact

Links

Community Wind & Wind Energy and the Environment

- Coop & Community Wind
- Landowner Easements & Royalty Payments
- Wind Energy & the Environment
- Reviews
- En Français

Coop & Community Wind

- Comments on New Brunswick's Community Wind Initiative by Paul Gipe
- Community Wind: Locally owned wind turbines in your community by Greg Pahl (Mother Earth News forthcoming)
- Advantages of Community Energy Projects by Tam Hunt, Community Environmental Council (Santa Barbara, Calif.)
- Co-operative Development in a Competitive World by Russ Christianson
- Wind Energy Cooperative Development in Anglophone Canada (March 2007)
- The Cost of the Iraq War and the Lost Opportunities for Development of Renewable Energy (1% to 38% of supply)
- Reaching Community Wind's Potential by Windustry
- Community Wind: A Review of Select State and Federal Policy Incentives by Farmers Legal Action Group
- People Power, Danish-style: Why European and American winds blow in opposite directions by NRDC
- German Solar PV for free Says Walter Fischer
- Freiburg's Solar Siedlung and Plus Energy Houses
- Dardesheim: Germany's Renewable Energy City
- Paderborn and the Sintfeld Community Wind Project
- American Energy Independence through Cooperative Investment in Wind Energy by Mike Kendall
- New Association of Wind Cooperatives Forms in Quebec
- Brief Summary of World Solar PV Market State 2006

Wind Power

LE GRAND LIVRE DE L'EOLIE

WIND ENERGY COMES OF AGE

WIND POWER IN VIEW

Fet

Inicia

H:\EnergiaNew\Eolica...

Safata d'entrada per ...

Community Wind & W...

Documentaciografica ...

17:14

Projectes comunitaris, EUA



[Wind Basics](#)[Your Wind Project](#)[Policy & Research](#)[Networks](#)[News & Events](#)[About Windustry](#)

[Home](#) [Your Wind Project](#) [Community Wind](#)

Your Wind Project

- Community Wind**
 - [Community Wind Toolbox](#)
 - [Community Wind Projects](#)
 - [Community Wind Project Resources](#)
- [Leasing Your Land to a Developer](#)
- [Home and Farm Scale Wind](#)
- [Wind Energy Companies](#)
- [Don't Know Where to Start?](#)

Search

Sign up for the Windustry email newsletter!

[CLICK HERE to subscribe](#)

Privacy by SafeSubscribeSM

Related Information

Community Wind

Community wind is a growing sector of wind development that promises to increase local energy independence and prosperity without contributing to global warming.

Use this section of the web site to learn about how community wind works, see how others have put together community wind projects, and find tools and resources to help you or your community develop your own community wind project! Use the links at left to explore different aspects of community wind. You'll also find a list of some of our favorite resources about community wind at the bottom of the page.

But first, here's a little bit of explanation about what community wind is:

Rural landowners who possess windy land currently benefit from the wind resource primarily by leasing their land to large wind developers who sell the wind energy. Others have installed their own wind turbines, individually or through local small businesses including farms, and local organizations such as schools, universities, Native American Tribes, rural electric cooperatives, municipal utilities, and even religious institutions. These projects keep more dollars in local communities, preserve local energy independence and protect the environment. This is the growing field of community wind.

The key feature of community wind is that local community members own and have a significant financial stake in the project beyond just land lease payments and tax revenue. Community wind projects can be any size, ranging from a single turbine to more than one hundred, yet typically serve local communities or consumers. Community wind projects have been installed throughout the country and are in the planning stages in virtually every state with wind power development underway. The map below shows where and how much community wind is operating today.

Mark your calendar!

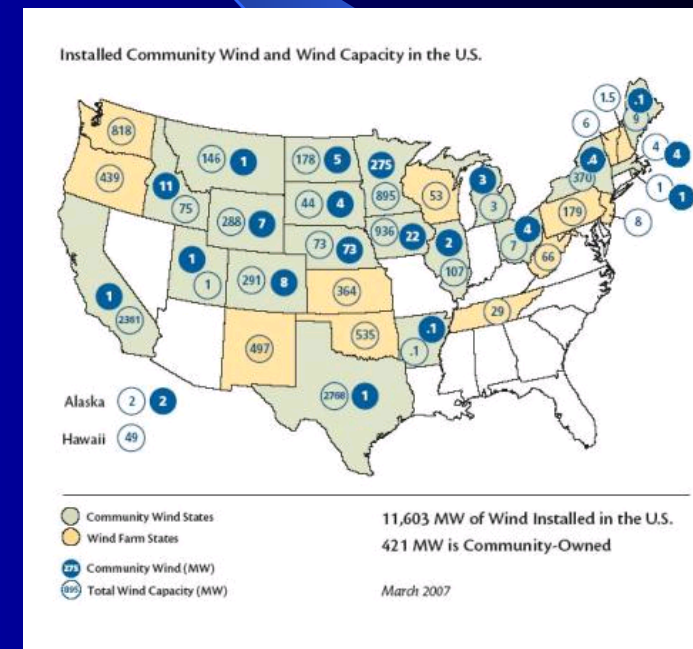
for the
Wind Energy Center
at the MN State Fair's EcoExperience!

Aug. 21 to Sept. 1
at the MN State Fair in St. Paul, MN

Click here to learn more.

What is community wind?





Projectes comunitaris, EUA

Community Energy : Summary - Mozilla Firefox

Fitxer Edita Visualitza Historial Adreces d'interès Eines Ajuda

http://www.newwindenergy.com/wind-farms/wind-farms-summary/

community wind energy

HOME | ABOUT US | INDIVIDUALS | BUSINESSES | WHOLESALE | WIND FARMS | EDUCATION

COMMUNITY ENERGY
An Iberdrola Renewables Company

IBERDROLA RENEWABLES

BUSINESSES
► Wind power for your business

INDIVIDUALS
► Wind power for your home

WIND FARMS
► Learn more about our projects

Home ► Wind Farms ► Summary

Summary ►
Wind Farm Map ►

Wind Farms

Nationwide

Partnered with **IBERDROLA RENEWABLES**, the world's largest wind energy developer, Community Energy, Inc. (CEI) is helping to build new wind farms nationwide. Working with customers, landowners and local communities, we are bringing the benefits of wind power to more than 15 states from New England to the Rocky Mountains, benefitting local communities and the environment.

Click "Wind Farm Map" in the side navigation, and view some of our projects!

Benefitting the Community

Farmers and property owners who lease their land for wind farms enjoy a steady income and experience little or no disturbance to grazing routines or farming operations. Towns and communities benefit from a larger tax base, which supports schools and local infrastructure. The development and operation of the wind project creates temporary construction jobs and long-term management jobs.

"Having four wind turbines on our land has been exciting. They are beautiful, silent, and our cattle can still use the vast majority of the land. Folks occasionally stop by to admire the windmills and ask for information. It's nice to have an extra income source, and being a part of clean, local energy production makes us proud."

- Bob and Tomalee Will, landowners, Somerset, PA

Working with a Global Leader

Community Energy is partnered with the largest owner and operator of renewable energy in the world - IBERDROLA RENEWABLES. Operating in 19 countries, with a global portfolio of projects representing more than 42,000 MW of renewable power, IBERDROLA RENEWABLES has a firm environmental commitment. IBERDROLA RENEWABLES' expertise in wind energy development, along with their access to wind turbines and capital, will enable CEI to accelerate the development of U.S. wind farms by linking customer demand to new wind farm construction.

PRESS RELEASES » More News

May 08, 2008
Green Power Programs Partnered with Community Energy Reach New Milestones
» Read More

April 29, 2008
Community Energy Announces Results of Earth Day Green Power Challenge
» Read More

FEATURED CUSTOMER

dansko

Fet

Inicia

Safata d'entrada per ...

Community Energy : ...

16:14

Projectes comunitaris, Ca

Home | Windshare - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.windshare.ca/ coop wind energy

Getting Started Latest Headlines

[News & Media](#) | [Members](#) | [Our Partners](#) | [Contact Us](#) | [FAQ](#) | [AGM 2008](#)

WindShare



COMMUNITY. POWER IN YOUR HANDS
POWER. 100% WIND
PROFIT. INVEST IN YOUR ENERGY FUTURE

News: [2007 Annual General Meeting & Board Elections Announced](#)

About WindShare	Exhibition Place Turbine	The Lakewind Project	Membership & Investment
A pioneering 'for-profit' co-op with a mandate to provide renewable electricity to the people of Ontario through community ownership.	WindShare's ExPlace turbine is an urban icon and a beacon for renewable power (and it keeps the lights on at over 200 homes!).	WindShare is building North America's first community-owned wind farm, providing 100% wind power to 3400 homes.	Become a WindShare member: invest in a renewable energy future and profit responsibly.
LEARN MORE →	LEARN MORE →	LEARN MORE →	INVEST NOW →

Done

Start | Inbox - Microsoft Outlook | Home | Windshare - M... | Document1 - Microsoft W... | 11:11

Projectes comunitaris, Ca



About Us

[History of TREC](#) | [Mission](#) | [Partners](#)

Project Development

[WindShare](#) | [LakeWind](#) | [SolarShare](#)

Renewable Energy Education

[Education](#) | [Resources](#) | [Tours](#)

Quick Links



About Us

The Toronto Renewable Energy Co-operative (**TREC**) is a non-profit, co-operative, environmental organization.

TREC's mission is:

- ◆ Project Development: To develop co-operatively owned renewable energy and energy efficiency/conservation projects
- ◆ Education: To educate Toronto citizens and visitors about renewable energy, energy efficiency/conservation and the community power model.

Renewable Energy + Co-operative Ownership = Community Power

What is a Community Power Co-operative?

Renewable energy is based on sources of energy such as water, wind and sun. These sources are renewable and can be harnessed without creating emissions that lead to smog, climate change and radioactive wastes.

A co-operative is a group of individuals who have identified a common goal and created a formal association to meet that goal using a democratically-controlled business model. Each co-op member has one vote in deciding co-op affairs.

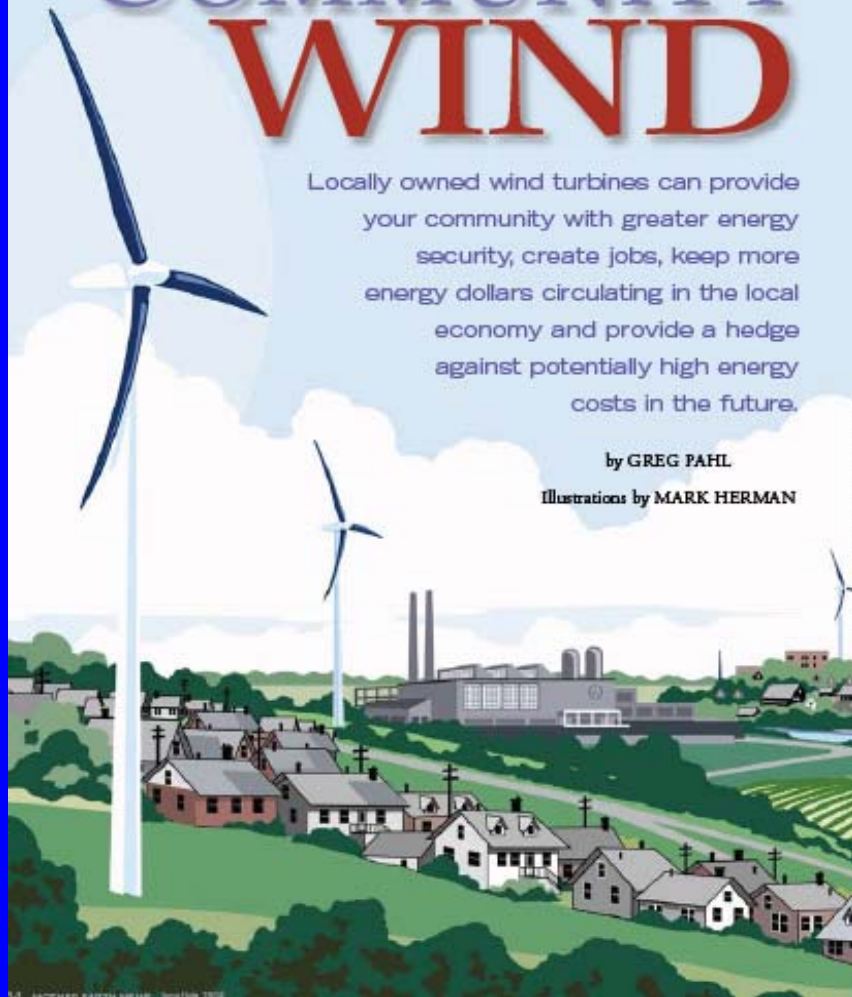
Community power co-operatives are organized to develop local member-owned renewable energy projects.

COMMUNITY WIND

Locally owned wind turbines can provide your community with greater energy security, create jobs, keep more energy dollars circulating in the local economy and provide a hedge against potentially high energy costs in the future.

by GREG PAHL

Illustrations by MARK HERMAN



SUPPORTED POWER

Perhaps you'd like to have a wind turbine in your back yard, but for one reason or another, your property just doesn't have a good wind resource. Don't despair, because someone else in your community might have an excellent site to put one or more turbines, where the wind always seems to blow. And if you can attract enough support from area residents, you may be able to install a medium to large-scale, locally owned wind turbine project that can benefit everyone in the community. Impossible? Not at all. In fact, this strategy has been used successfully for many years in Europe, and is the very foundation of the Danish wind industry, long recognized as a world leader in the wind sector.

During the OPEC (Organization of Petroleum Exporting Countries) oil embargo and subsequent oil crises of the 1970s there was a flurry of wind turbine activity in the United States, and some significant advances were made in the technology. But in the early 1980s, when the Reagan administration dismantled the energy tax credits and incentives that had encouraged the installation of alternative energy systems nationwide, the U.S. wind power industry collapsed.

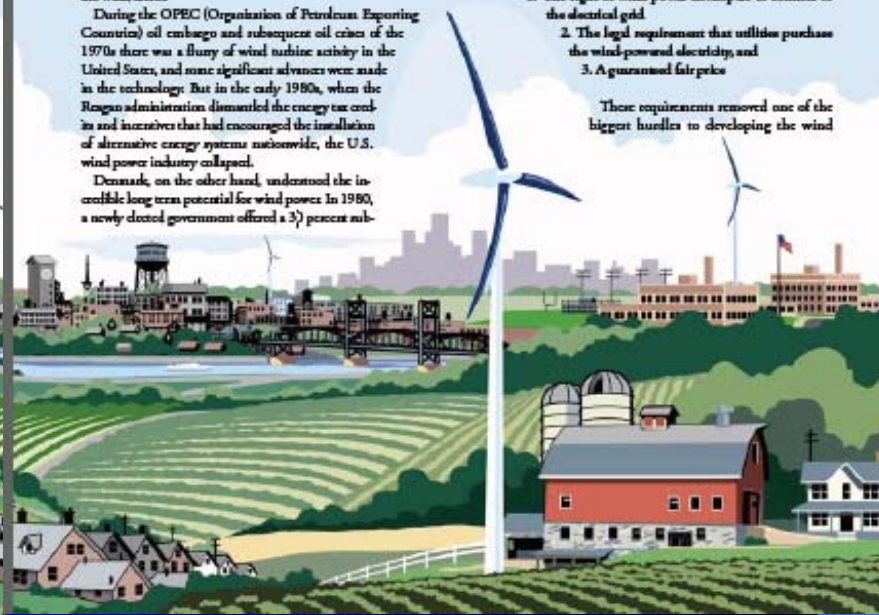
Denmark, on the other hand, understood the incredible long term potential for wind power. In 1980, a newly elected government offered a 3% percent sub-

sidy for the construction of new wind energy projects, and after a 20 year partnership between government and industry, Denmark emerged as the world leader in the wind industry.

What most Americans don't know is that the vast majority of wind installations in Denmark were composed of small groups or clusters of mid-sized turbines, not the huge wind farms of today. And these Danish wind turbines were operated by farmers, homeowners and small businesses, either independently, or more frequently, as cooperative ventures. These were three key components to the Danish wind initiative:

1. The right of wind power developers to connect to the electrical grid.
2. The legal requirement that utilities purchase the wind-powered electricity, and
3. A guaranteed fair price.

These requirements removed one of the biggest hurdles to developing the wind





Top Story

Al Qaeda in Iraq Ramps Up Its Racketeering

Latest News

Pistons beat Celtics to steal home-court

BUSINESS

Big Power Goes Local

A grass-roots movement to generate power in towns and basements is challenging the energy industry's status quo.



Una proposta

- L'eòlica amb el suport de la gent (de la comunitat) te la capacitat de fer una contribució significativa a casa nostra
- Intents no reeixits en el passat
- Serem avui capaços d'estar a l'altura del repte?

25 anys de la inauguració de
l'aerogenerador Ecotècnia 12/15

Viure de l'aire del cel



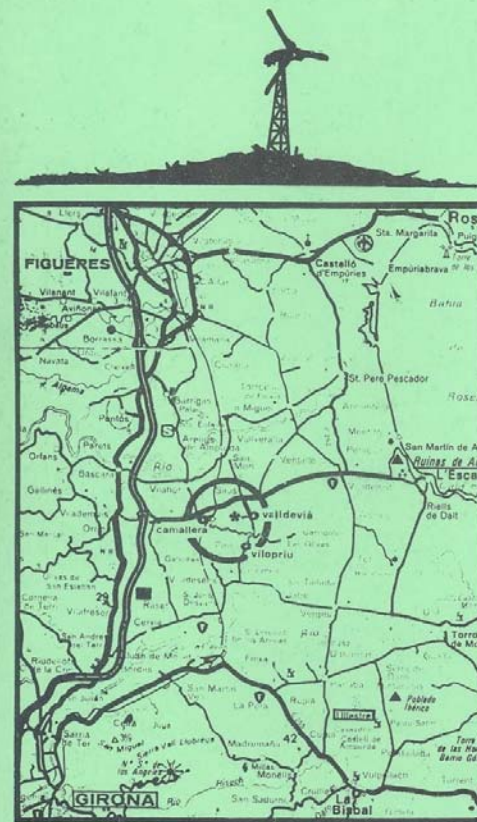
Ara fa 25 anys . . .



ecotècnia
SOC. COOP. CATALANA
per a l'autonomia tecnològica
Dermòstenes, 23
Barcelona - 28
Tl. 330 78 60



**10 març 1984
INAUGURACIÓ
AEROGENERADOR
12/15**



ecotècnia es complau a convidar-vos a la inauguració del primer aerogenerador 12/15 instal·lat al terme municipal de Vilopriu (Baix Empordà), que tindrà lloc el proper dissabte 10 de març de 1984.

El programa d'actes previst és el següent:
2/4 d'11 Recepció a la plaça de Vilopriu.

11 Presentació del projecte amb projecció de diapositives i pel·lícula.

1 Inauguració i posta en marxa de l'aerogenerador. Xampany i aperitiu.

i, per a celebrar-ho, hem previst servei de menjars (*), ball de tarda, i un esclatant fi de festa.

(*) Cal fer reserva prèvia del ticket, abans del 5 de març, trucant al telèfon 330 78 60.

ECOTÈCNIA S.COOP.CAT le invita a la inauguración del primer aerogenerador 12/15 instalado en Vilopriu, el próximo día 10 de marzo de 1984.

El programa previsto es:

10.30 Recepción en la plaza de Vilopriu.

11 Presentación del proyecto con proyección de película i dispositivas.

1 Inauguración. Vino de cava y aperitivo.

y para celebrarlo hemos previsto servicio de comida(*) baile y un brillante fin de fiesta.

(*) Es necesaria la reserva previa del ticket antes del día 5 de Marzo, llamando al 330 78 60.

ECOTÈCNIA S.COOP.CAT. invites you to the inauguration of the first windgenerator 12/15 installed at Vilopriu, that will take place on march 10th. 1984.

Program:

10.30 Reception at Vilopriu's place.

11 Presentation of the project : film and slides.

1 Inauguration. Champagne and snacks.

To celebrate it, food service, donzing and final celebration.

10-3-1984

BARCELONA

Avui s'inaugura a Vilopriu un aerogenerador eòlic

El projecte, construït totalment a Catalunya, permetrà aprofitar l'energia del vent

La societat cooperativa, Ecotècnia, inaugura avui al terme municipal de Vilopriu un aerogenerador que transforma l'energia del vent en corrent elèctric. Aquest projecte, que constitueix, el primer *Sistema Conversor d'Energia Eòlica* de mitjana potència totalment construït a Catalunya, ha estat finançat pel *Centro para el Desarrollo de la Tecnología Industrial*, després de superar no pocs impediments burocràtics.

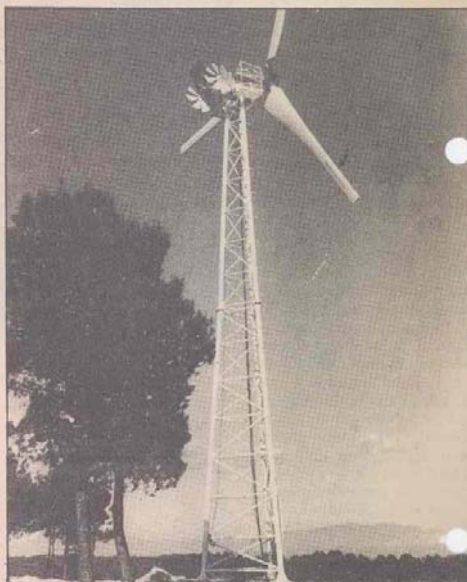
Vilopriu (Baix Empordà).— Avui, a la una del migdia s'inaugura al terme municipal de Vilopriu, un aerogenerador 12/15, que ha sigut dissenyat i construït per la Societat Cooperativa *Ecotècnia*. L'aerogenerador 12/15 és una màquina productora d'electricitat, accionada pel vent. Es tracta d'una forma d'aprofitar l'energia eòlica —energia del vent— amb una font renovable, abundant, descentralitzada, i no sotmesa a costos creixents.

L'aerogenerador 12/15 està constituït per una triple pala, un eix horitzontal, i de pales fixes de cara al vent. Està constituït per una triple pala, un eix horitzontal, i de pales fixes de cara al vent. Està construït amb una tecnologia avançada, que ha permès de construir un aparell senzill, acordinàmic, fàcil de transportar i d'instal·lar, així com amb unes necessitats mínimes de manteniment. El rotor té un diàmetre de dotze metres, i està fixa al damunt d'una torre, formada per un tripode d'uns 14 metres d'alçada.

Les aplicacions de l'aerogenerador són molt diverses, pot ésser utilitzat per abastir d'electricitat un grup d'habitacles (10 vivendes d'unitats familiars), per a una granja agrícola, per instal·lacions de rec o de bombeig d'aigua, per a petites indústries... Fins i tot po-

den formar centrals elèctriques amb utilització simultània de diversos aparells. En aquest sentit, cal dir també, que l'aerogenerador pot funcionar connectat a la xarxa de distribució elèctrica o bé autònomament. Quan es produeix, amb l'aparell, més energia de la que hom necessita, es prefeble vendre-la a la companyia elèctrica. Així també, quan no fa prou vent, es pot comprar energia de la xarxa de distribució. Quan no està connectat l'energia sobrant del consum immediat, pot ésser acumulada a bateries. La producció anual aproximada pot ésser calculada en 38.700 kw/h. si està instal·lat en un indret on el vent tingui una mínima velocitat. La vida de l'aparell es calculada en uns aproximadament vint anys.

El projecte de construcció d'aquest aerogenerador arrenca del maig de 1980, quan es van tenir els primers contactes amb el *Centro para el Desarrollo de la Tecnología Industrial (CDTI)*, al que *Ecotècnia* va proposar de construir un aerogenerador de mitjana potència. L'octubre de 1981, i enmig de moltes altres propostes, el projecte de *Ecotècnia* és aprovat; el novembre es signa el contracte entre la cooperativa i el ministre d'Indústria, senyor Bayón. Malgrat que el projecte és inclòs dins del *Plan para el Fomento y la Investi-*



L'aparell, segons els seus dissenyadors i constructors, constitueix una important passa per a aconseguir l'autonomia tecnològica i energètica

gació e Innovación Tecnológica, la resolució del concurs no és resolt, pel fet de que el ministeri no assigna les dotacions econòmiques corresponents. Finalment a l'estiu de 1982, el *Consell Rector del CDTI* aprova el finançament del 90% del projecte, que permet que la iniciativa tiri endavant i que el gener d'enguany es comenci a instal·lar l'aerogenerador a Vilopriu.

Aquest aerogenerador 12/15 d'*Ecotècnia* és el primer sistema conversor d'energia eòlica de mitjana potència que s'ha construït i dissenyat totalment a Catalunya. *Ecotècnia* és una cooperativa que

vol oferir una sèrie de productes i serveis que promoguin una tecnologia que permeti un millor aprofitament dels recursos naturals i locals, i que sigui respectuosa amb el medi ambient i natural. En aquest sentit ha treballat també en la implantació de l'energia solar, biomassa i el reciclatge de productes. En el terreny de l'energia eòlica, ha desenvolupat, a més dels molins de vent, un conjunt d'equips per al control i la connexió a la xarxa d'aerogeneradors, així com de càlcul i d'assessorament de sistemes eòlics, i de medicina de velocitats de vents.

■ Carles Llorens

Ara fa 25 anys . . .

Diari de Barcelona,
10 de març de 1984



Ara fa 25
anys . .



Newsletter of the British and WIND Directions

European Wind Energy Associations

Volume IV, No. 1

JULY 1984



SPANISH WIND TURBINE INAUGURATED

A 12m diameter turbine of Spanish design and manufacture now producing electricity in Catalonia.

European News reports specifications of this machine.

IN THIS ISSUE

M.A.N. gives specifications of new 60m diameter 1.2 MW turbine for Helgoland Cape Verde wind projects described in Developing World feature Australian manufacturer designs and makes 60 kW turbine European News updates readers on acceleration of French Wind Energy programme, Belgium's wind energy test site, progress with WTS-3 and Kamewa 2MW turbines in Sweden, new Dutch 13.3 m diameter turbine, wind energy in the Greek Islands, and Italian wind energy programme U.K. to have small wind turbine test site U.K. manufacturers obtain overseas sales for turbines . . . Vertical axis wind turbine under construction at Carmarthen Bay in Wales U.K. Energy Act seminar proceedings available A Scottish island relies on wind power.

European News

SPAIN COMMISSIONS 12m DIAM. WTG.

The inauguration of a 3 bladed, 12m diam. upwind Wind Turbine took place on March 10th at Viloprius Town Hall in Girona.

The event was of special importance to Spain as the machine was designed and manufactured in Catalonia. The General Director of Energy Policy of the Generalitat and officials responsible for Renewable Energies in the Ministry of Industry and Energy were present. After a presentation by the manufacturer Ecotecnía S. Coop Ltd., more than 500 people visited the windmill about 2km distant. The inauguration was accompanied by a fireworks display and dancing! A detailed specification of this machine accompanies this article.

15kW. Wind Turbine Specifications

General Description: Horizontal axis, fixed pitch, propeller type, up-wind.

Rotor:

number of blades	3
diameter, m	12
speed, r.p.m.	65 - 42
rotation direction	clockwise
location, rel. to tower	upwind
type of hub	rigid
coning angle	0°
tilt angle	10°

Blade:

total length, m	5.75
root, m	0.25
blade, m	5.50
material	fibre-glass reinforced polyester
weight, kg.	70
airfoil section	NACA 44 series
twist	30°
tip chord, m	0.35
root chord, m	0.85
tip speed, m/s.	41
solidity	0.086
swept area, m ²	113

Tower:

type	tubular steel tripod, field erectable and maintained without use of crane.
tower side	
at the base, m	2.60
at the hub, m	0.50
tower material	steel
height, m	14
hub height, m	tower height plus 0.5 m
ground clearance, m	8.5
weight, kg.	800
foundation	three concrete footings

Transmission:

type	two stages
ratio	1:23.6
input speed, r.p.m.	65
output speed, r.p.m.	1534

Main generator:

type	induction
rating, kW.	20
power factor	0.85
voltage, V.	220/380 AC three phases
speed, r.p.m.	1500
frequency, Hz.	50

Secondary generator:

type	induction
rating, kW.	3.5
power factor	0.83
voltage, V.	220/380 AC three phases
speed, r.p.m.	1000
frequency, Hz.	50

Orientation drive:

type	passive yaw
yaw rate, °/sec.	3
yaw drive	auxiliary propeller and mechanical transmission

Control system:

rotor speed control	stall-regulated
overspeed control	fail safe hydraulic disc brake on main shaft
overspeed control	spoilers with manual reset (emergency)

Performance:

rated power, kW.	15
maximum power, kW.	18
wind speed at centreline of hub:	
start-up, m/s.	4
cut-in, m/s.	3.5
rated, m/s.	9.5
max. prod., m/s.	14
cut-out, m/s.	30
maximum design, m/s.	60

Annual power output (estimated).

5.7 m/s. (20 km/h) at 18m. 38700 kWh.

Weight:

above tower, kg.	1500
tower, kg.	800
total, kg.	2400

System design life:

all components, years 20

Basic price FOB:

3500000 pts (\$23500)

More detailed information, available at:

ECOTECNIA S. COOP. LTD.
Demostenes 23,
Barcelona 28, (Barcelones),
Catalonia, Spain.
Tel: (93) 3307860

25 anys després . . .

- *“I’m also happy to provide my support for your event making the 25th anniversary of the first wind turbine in Catalonia. The leadership shown by Catalans in 1984 has laid the foundation for a transformation of the energy system in the years ahead.”*

Christopher Flavin
President



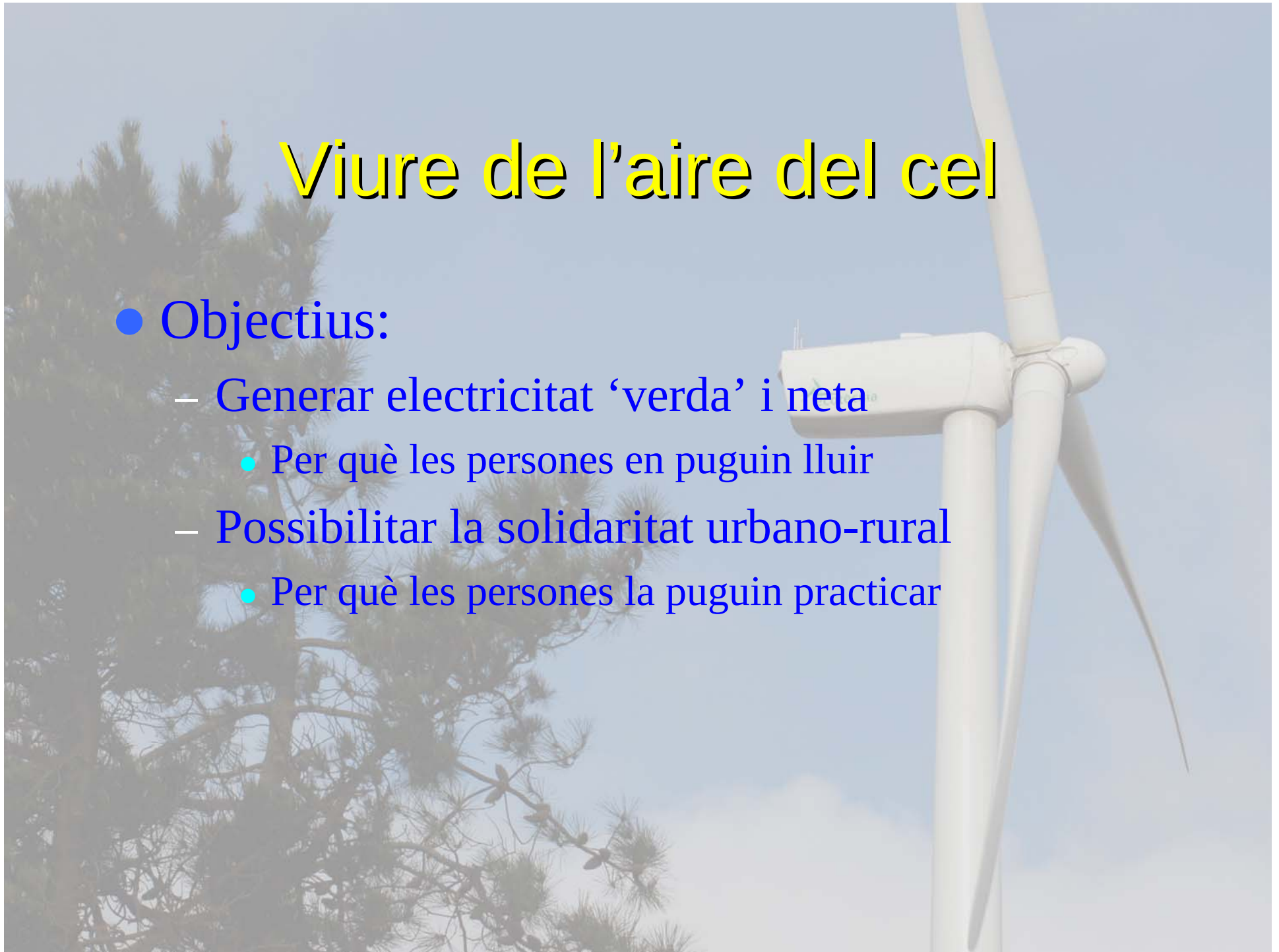
25 anys després . . .

- El projecte ‘Viure de l’aire del cel’
 - Instal·lar un aerogenerador de 1.670 kW de potència en un indret rural de Catalunya.
 - Cost: 2.000.000 €
 - Energia produïda: 3.340.000 kWh/any, funcionant 2.000 hores eq./any
 - Propietat de la gent

Viure de l'aire del cel

- Objectius:

- Generar electricitat 'verda' i neta
 - Per què les persones en puguin lluir
- Possibilitar la solidaritat urbano-rural
 - Per què les persones la puguin practicar



Viure de l'aire del cel

- Com es paga el projecte?
 - El cost d'instal·lació i posada en funcionament es cobreix amb la participació de les persones individuals, famílies i entitats no lucratives.
 - 2.000 persones aportant 1.000 € cadascuna
 - 1.000 persones aportant 2.000 € cadascuna
 - 500 persones aportant 4.000 € cadascuna
 - 100 persones aportant 20.000 € cadascuna

Viure de l'aire del cel

- A quin lloc s'instal·larà?
 - El seu emplaçament s'escollirà entre els municipis rurals que es presentin a la convocatòria
 - Es poden presentar a la convocatòria tots els municipis rurals de Catalunya que tinguin fins a 5.000 habitants.
 - Suficient vent, bon accés i xarxa elèctrica

Viure de l'aire del cel

- Inversió :
 - Mínima: l'equivalent a la generació eòlica de 1.000 kWh/any en l'emplaçament triat.
 - Superior a la mínima: sempre en múltiples senters de la inversió mínima.
 - Opcions:
 - Cobrir el consum d'energia elèctrica
 - Cobrir el consum d'energia tèrmica
 - Cobrir el consum d'energia per a desplaçaments

Viure de l'aire del cel

- Exemple:

- Una família que tingui un consum anual

● Elèctric:	3.100 kWh	862 kg CO ₂
● Tèrmic:	7.850 kWh	1.562 kg CO ₂
● Desplaçament:	10.000 kWh	2.527 kg CO ₂

Viure de l'aire del cel

- Inversió:

- Elèctric: 1.856 €
- Tèrmic: 4.701 €
- Desplaçament: 5.988 €
- Elèctric + Tèrmic: 6.557 €
- El.+Tè.+Desp.: 12.545 €



Viure de l'aire del cel

- La legislació espanyola permet que qualsevol persona pugui
 - Ser generadora d'electricitat a partir de fonts renovables
 - Injectar l'electricitat generada a la xarxa
 - Vendre l'electricitat generada a un preu primat a l'empresa distribuïdora



Viure de l'aire del cel

- D'on surgeix la idea?
 - Cooperatives eòliques a Dk, UK, EUA, etc.
 - Projecte europeu *WELFI - Wind Energy Local Financing* (estendre l'experiència danesa a diversos països europeus)
 - L'intent no reeixit de l'empresa catalana TREN - Transformadora Racional d'Energia Natural, l'any 1990

Viure de l'aire del cel

- Qui llença la idea?
 - La secció catalana d'EUROSOLAR - l'associació europea per les energies renovables
 - Les energies renovables
 - Ofereixen un gran potencial de democratització del sistema energètic
 - Possibiliten la pràctica ciutadana de la democràcia energètica



Viure de l'aire del cel

- Qui promou el projecte?
 - Barcelona Grup d'Energia Local - BarnaGEL
 - 1994-2000: va ser l'agència local d'energia de Barcelona, surgida del programa europeu RUE (actualment, SAVE)
 - Avui: una associació que organitza anualment els Fòrums de l'Energia Sostenible



BARNAGEL
grup d'energia local

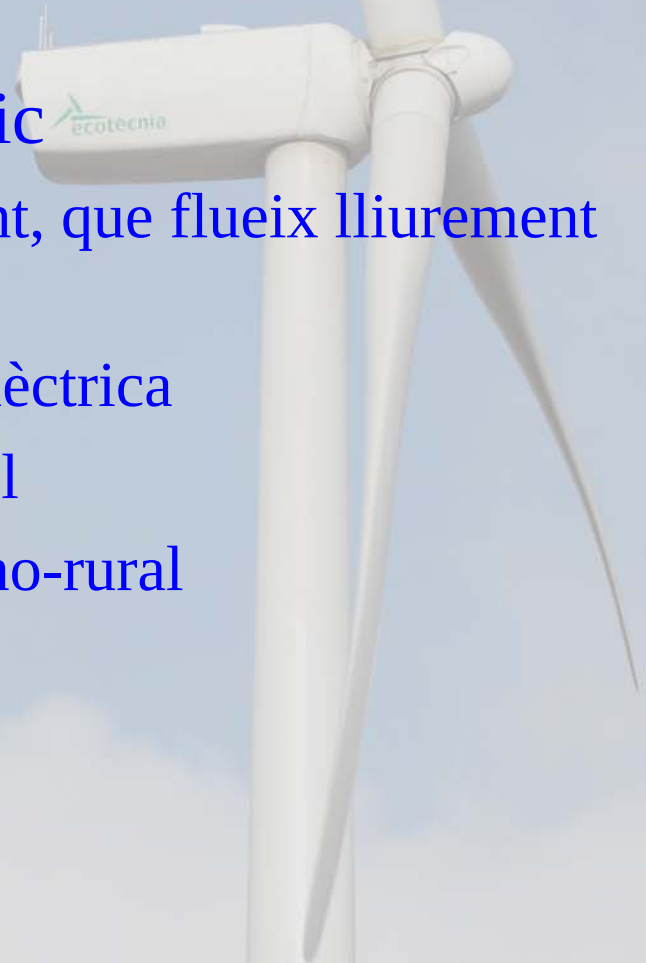
Viure de l'aire del cel

- Qui materialitzarà el projecte?
 - Una entitat empresarial creada per dur-lo a terme.



Viure de l'aire del cel

- Per què ara?
 - Per exercir el dret democràtic
 - a aprofitar un bé comú, el vent, que flueix lliurement per la biosfera
 - a transformar-lo en energia elèctrica
 - a decidir no emetre CO₂ fòssil
 - a practicar la solidaritat urbano-rural

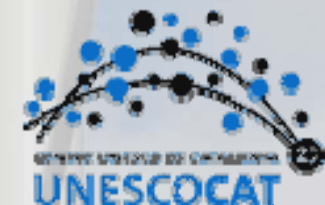
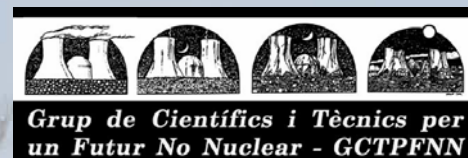


Viure de l'aire del cel

- Com participar en el projecte?
 - A partir d'avui enviant un correu-e a: barnagel@energiasostenible.org per fer la pre-inscripció
 - A partir del 22 d'abril (Dia de la Terra) accedint a un registre d'inscripció,
 - per confirmar la inscripció caldrà fer una aportació:
 - Persona física individual: 100 €
 - Família: 250 €
 - Entitat sense ànim de lucre: 500 €



El projecte 'Viure de l'aire del cel'
compta amb el suport de:



Gracies per la vostra atenció



Dr. Josep Puig, ing.ind.

**Eurosolar España
BarnaGEL**

eurosolar@energiasostenible.org
barnagel@energiasostenible.org