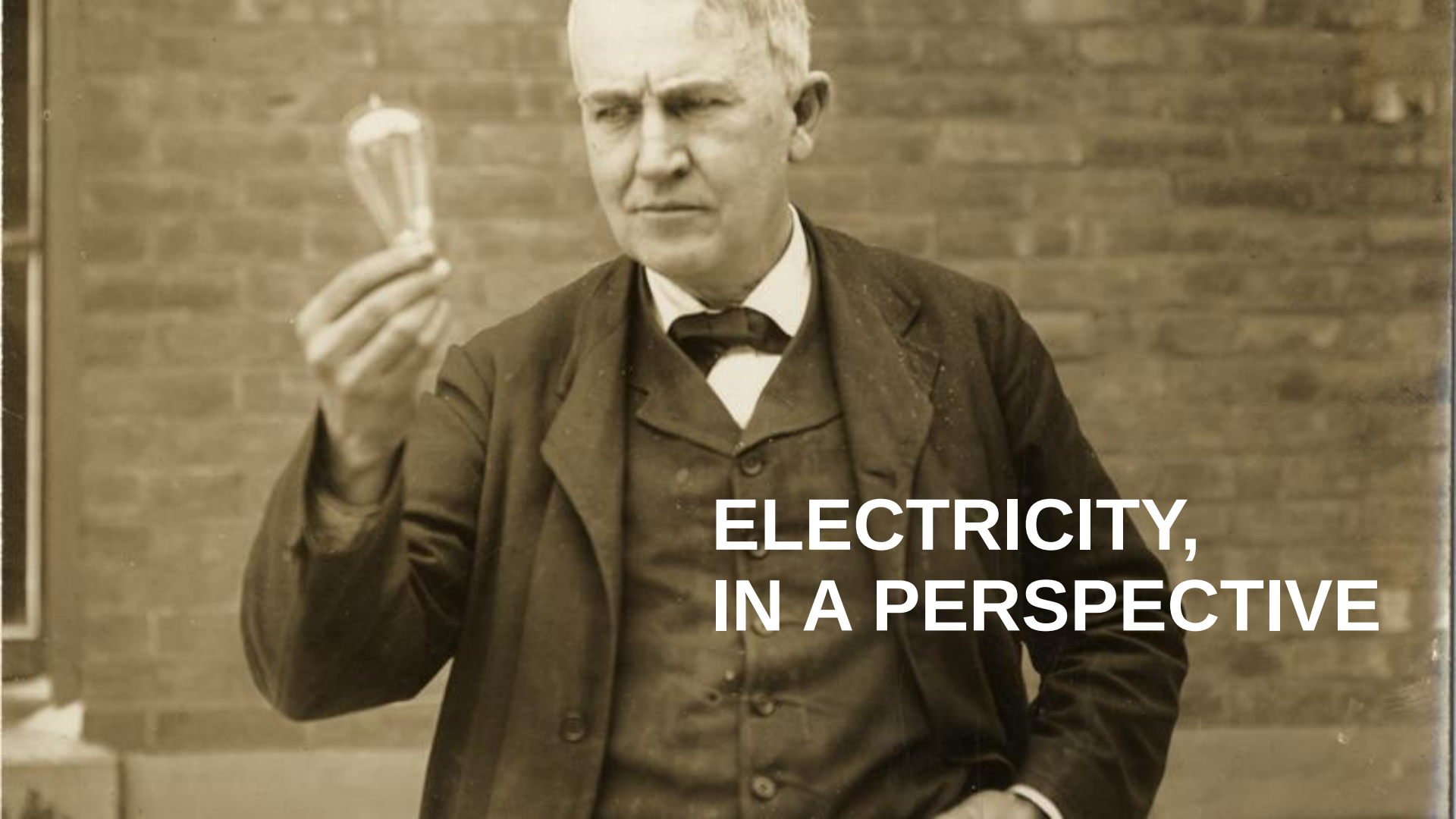
Porto Design Centre

A mudança do paradigma energético

05-06-2018



ELECTRICITY, IN A PERSPECTIVE

2016	**$0.2tr** Renewable	**$0.14tr** Fossil fuels & nuclear
2040	**$7.8tr** Renewable	**$3.2tr** Fossil fuels & nuclear

Total investment in power generation
Source: bnef

O desafio global

Em 2030, o mundo vai necessitar de…

Why we are here

35%
mais comida

40%
mais água

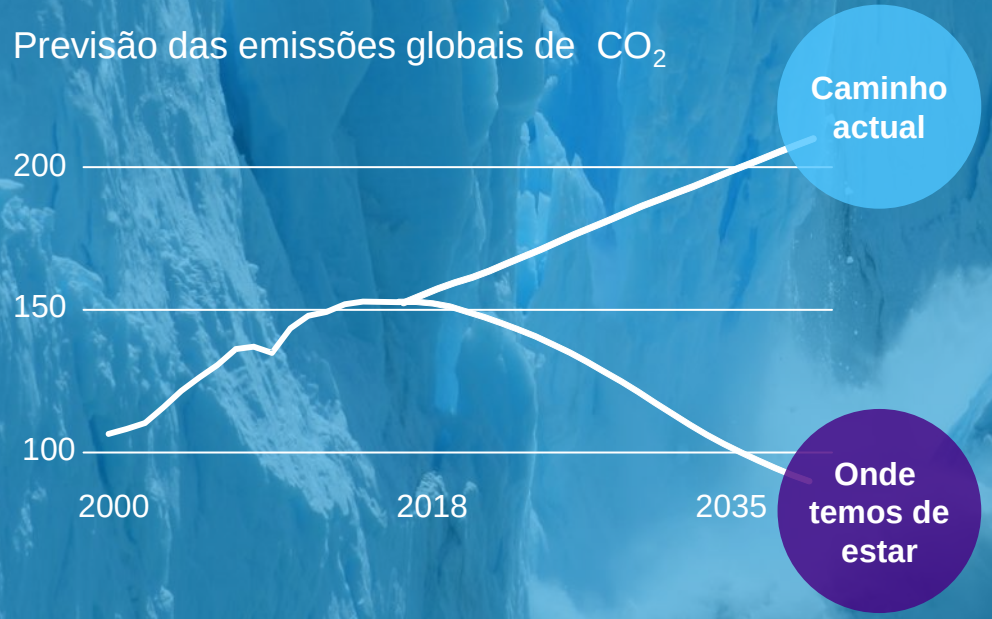
45%
mais electricidade

Source: UNPRI / IEA 2017
Reuters/Adnan Abidi

Vestas

O nosso objectivo

Previsão das emissões globais de CO_2



Source: IEA World Energy Outlook 2017

Respondendo ao desafio do clima global…

- Emissões globais de CO_2 estao destinadas a aumentar se os países continuarem no caminho actual
- Esta tendência tem de ser invertida para ter impacto no clima global e no bem-estar do nosso planeta
- Isto leva a uma imensa necessidade e oportunidade de crescimento para as **energias limpas**

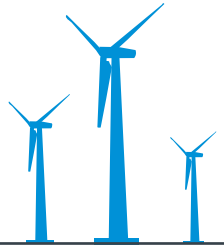
Vestas

Vestas em resumo

A única empresa de energia eólica global

+ 23,300

Empregamos mais de 23,300 pessoas em todo o mundo e temos mais de 35 anos de experiência com energia eólica

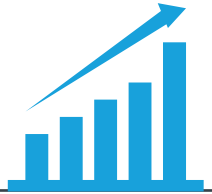


+38,892

Temos um total de 38,892 turbinas combinadas em serviço, ou cerca de 76 GW

+ 63,500

Temos mais de 63,500 turbinas ou 90 GW de capacidade instalada em 77 países cobrindo seis continentes



€ 9,953m

A receita da Vestas em 2017

Vestas Portugal

Factos e Números

20 Anos de presença em Portugal

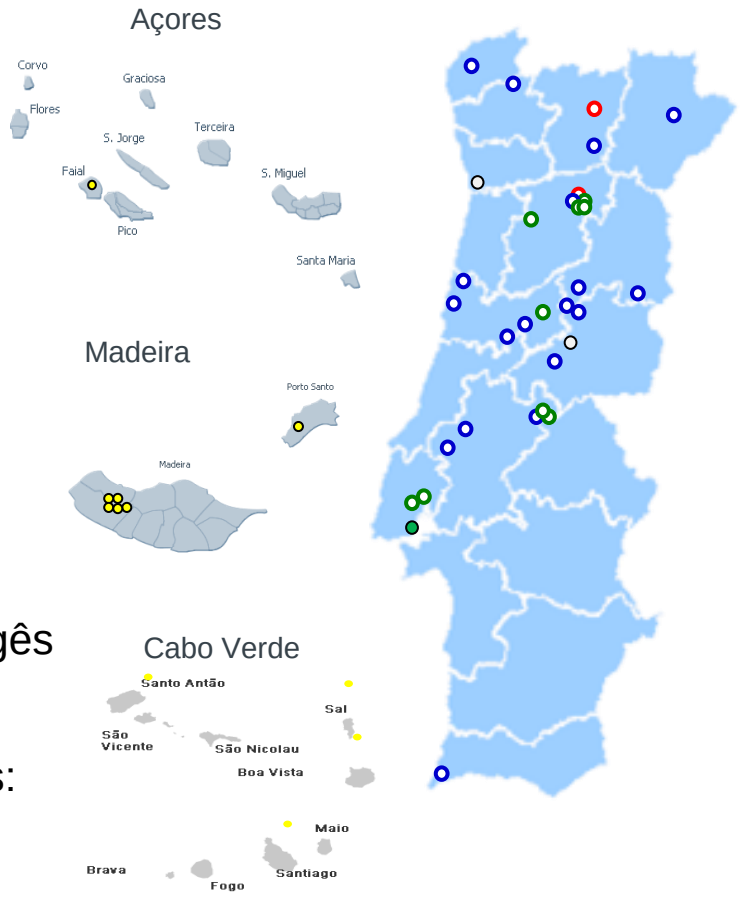
- ✓ Primeiro Parque Eólico instalado em 1996 (2 x V29)
- ✓ Abertura Escritório de Lisboa em 2004

Forte presença no **Norte,Centro e Ilhas**
Cabo verde sob Supervisão de Portugal

700 MW Capacidade Instalada
916 MW Em Manutenção (Multi-brand)

Compromisso a **longo prazo** no mercado Portugês

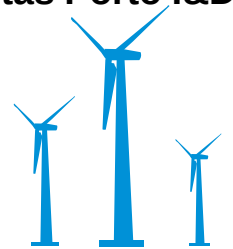
Excelente performance dos geradores eólicos:
98,5% de Taxa de Disponibilidade



O novo Hub de I&D

Factos e Números

Vestas Porto I&D



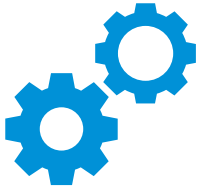
Áreas:

- ✓ Mecânica
- ✓ Electro
- ✓ Software e Control
- ✓ Gestão de Projectos
- ✓ Data Analytics

Investimento até 2020

- ✓ Centenas de Engenheiros até 2020

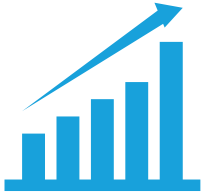
Cooperação



Relação próxima com:

- ✓ Universidades
- ✓ Indústria local
- ✓ Vestas global

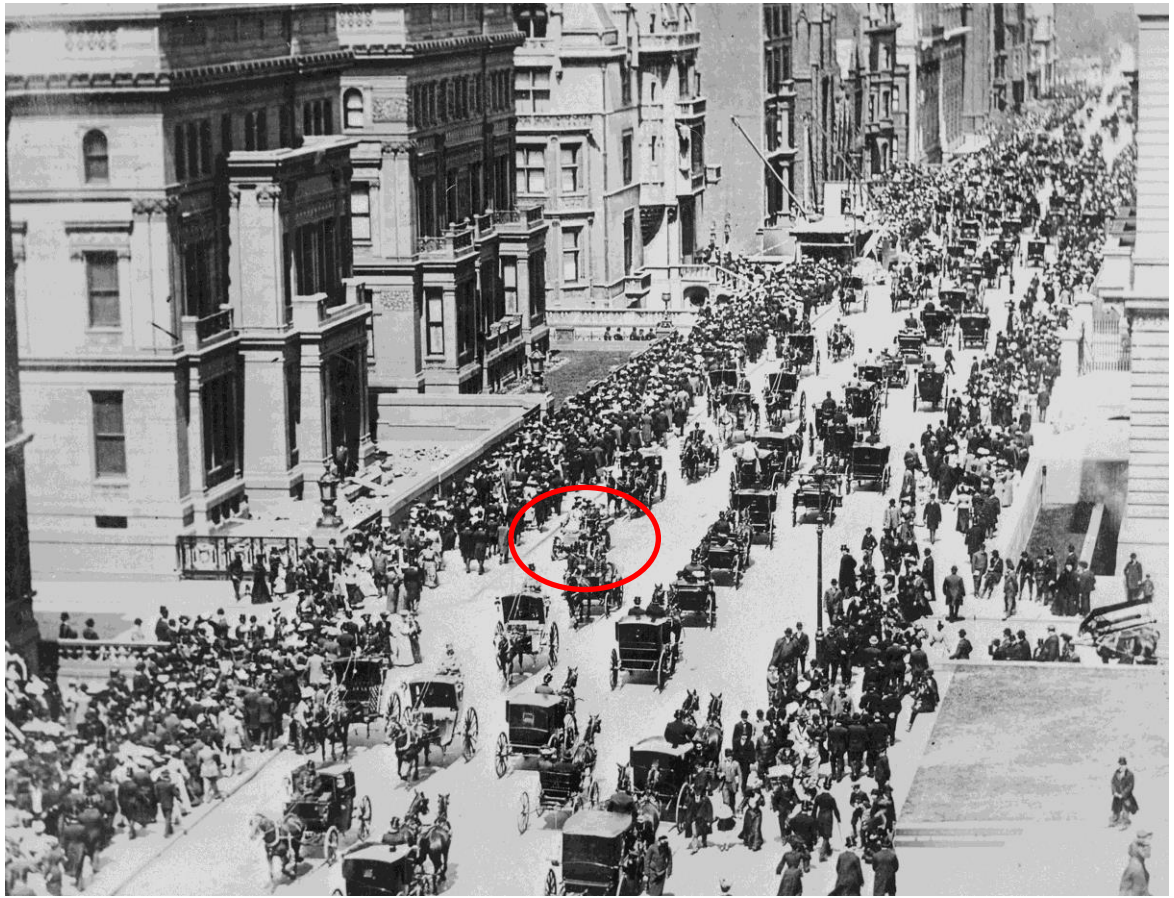
O mais importante



- ✓ Compromisso a longo prazo
- ✓ Desenvolvimento contínuo

5th Avenue, New York City, Easter parade, 1900

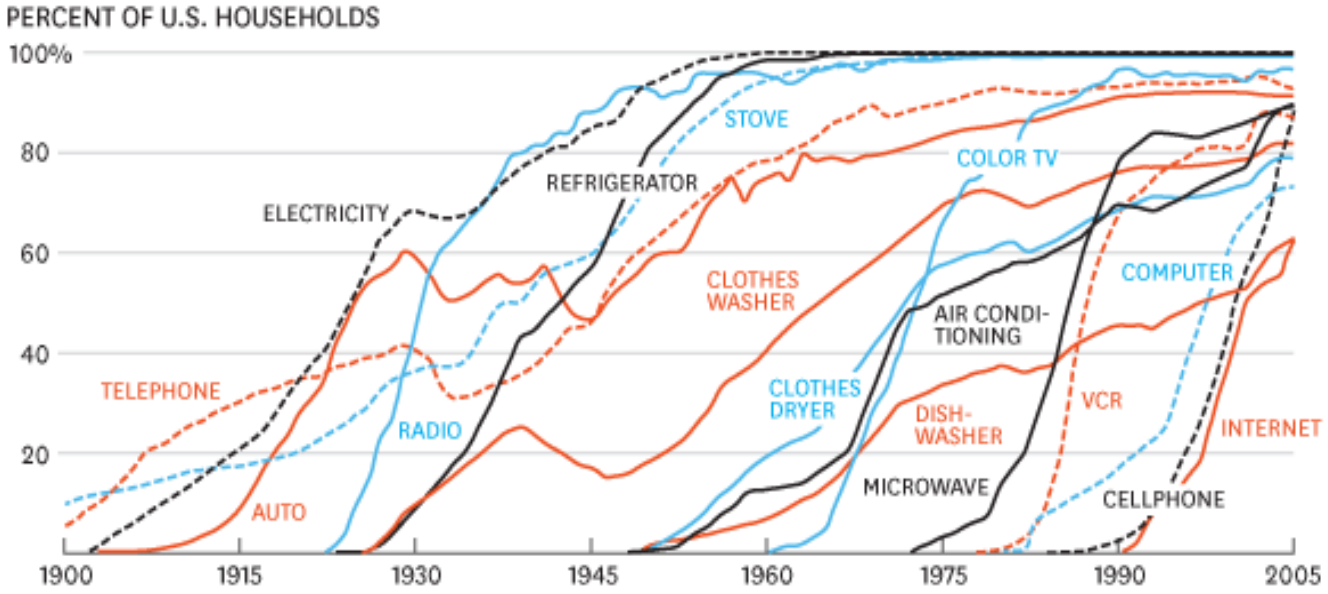
Where is the car?



5th Avenue, New York City, Easter parade, 1913

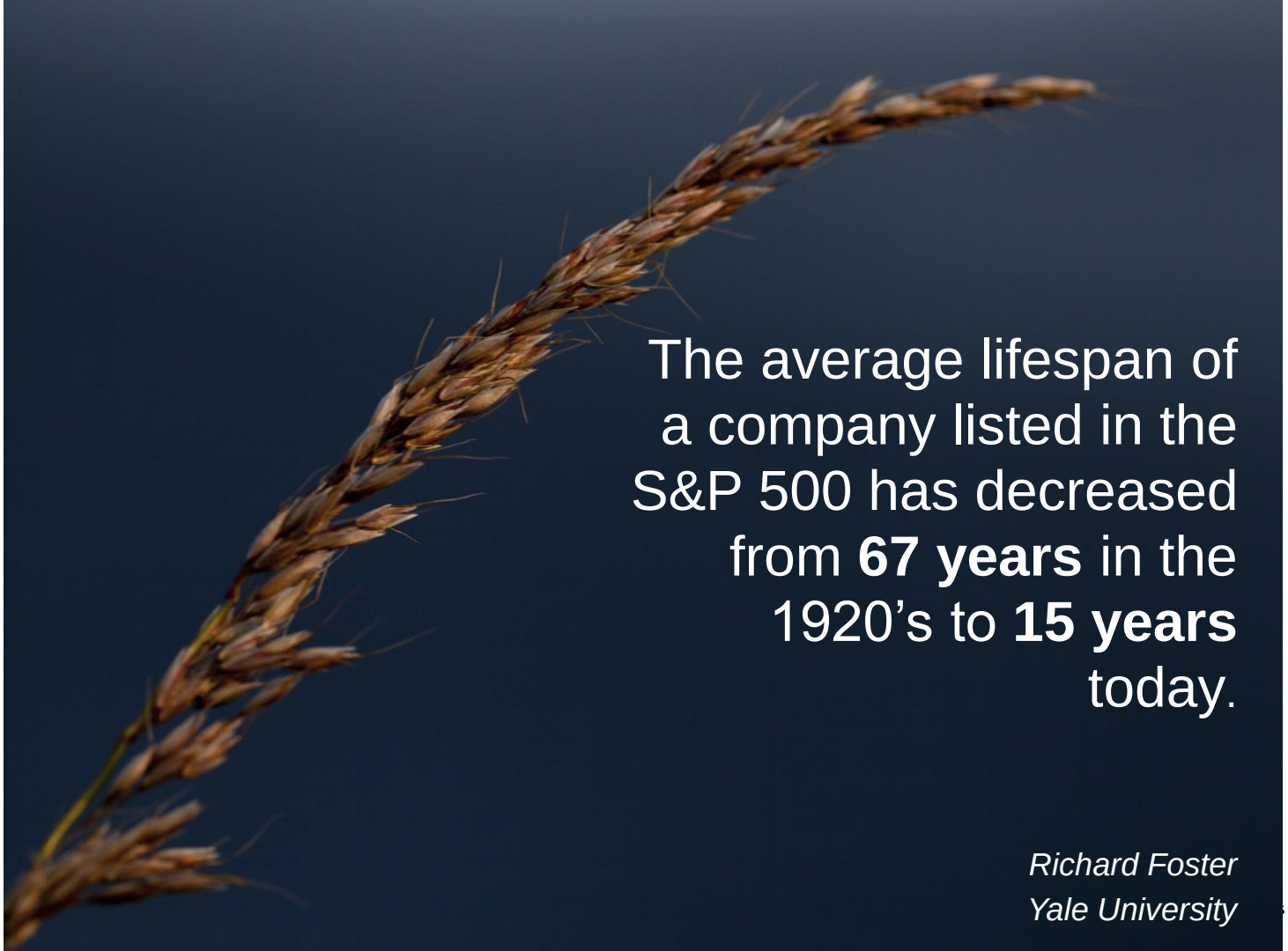
Where is the horse?

CONSUMPTION SPREADS FASTER TODAY



SOURCE MICHAEL FELTON, THE NEW YORK TIMES

HBR.ORG



The average lifespan of a company listed in the S&P 500 has decreased from **67 years** in the 1920's to **15 years** today.

Richard Foster
Yale University

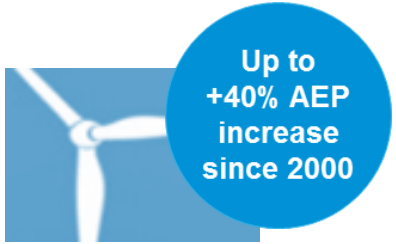
In **10 years**, **over 40%** of FORTUNE 500 companies will **no longer be here**

Source: Babson Olin School of Business Advertisement, Fast Company April 2011, page 121.

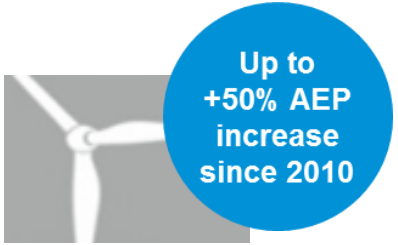
Remaining competitive: relentless focus to lower LCOE

Evolution of proven technology

Global platforms

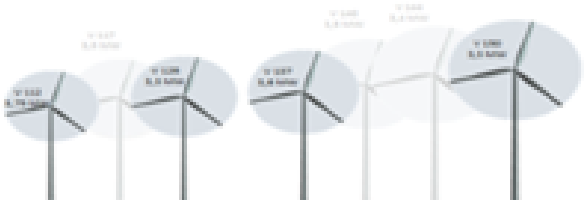


2MW

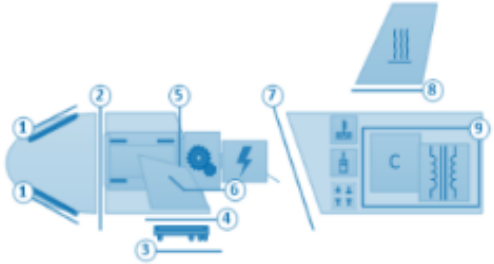


4MW

Product flexibility



Standardisation & modularisation



Enablers

Vestas

s the world to us.™

New technologies with significant potential to reduce LCOE

Innovation

Much lighter and more effective turbines

Additive Manufacturing, Advanced/Functional/Digital Materials, Design technologies/topology optimization, Real-time control, sensing and actuation

Streamlined value chain

Additive Manufacturing, Value chain technology, Robotics and drones, Digitalization/Industry 4.0

A fully digitalized energy business

Internet of Things, Interconnectivity Smart Data, Cloud computing, Advanced modelling and simulation, Real-time plant level control

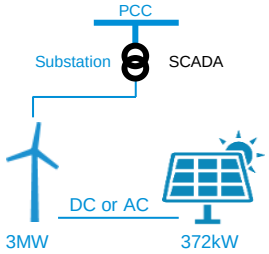
Flexible, multi-mix, distributed energy solutions

Short and long term storage technology, Power to fuel/wind to value, Power chain simplification, Energy Management System, Real-time control and communication, DC coupled PV and battery

Vestas Hybrid Power Plant Solutions

Small plants
Low solar/wind ratio

WTG-coupled

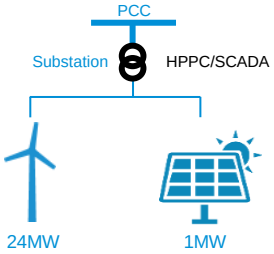


Wind and PV

Demonstrator in Spain

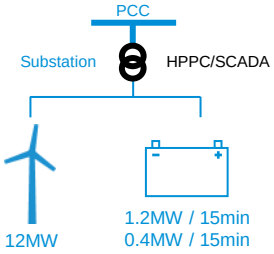
Large plants
Hybrid Power Plant Controller (HPPC)

Co-located & sharing substation and infrastructure



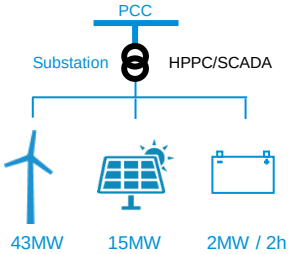
Wind and PV

Louzes, Greece



Wind and storage

Lem Kær, Denmark



Wind, PV and storage

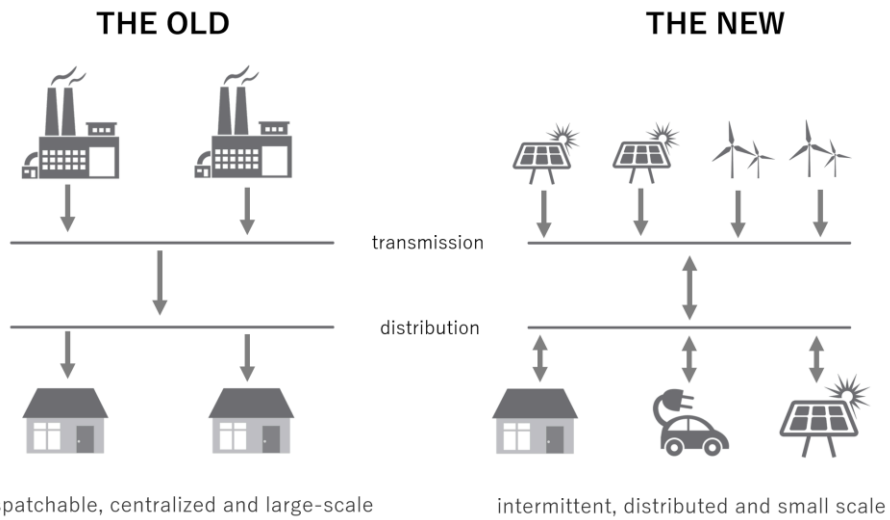
Kennedy, Australia

Vestas scope of work: **Full EPC & Service**

Remaining relevant: from one technology to system thinking

System thinking and digitalization necessary to enable high penetration of renewables

Moving from centralised to distributed generation poses new challenges…



…but also opportunities!