CambridgeIP

Climate Change Innovation & Partnership Models: Challenges and Opportunities

WIPO

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Outline: Climate change - Innovations & partnership models

- A Global Technology Library
- Intelligent knowledge transfer
- Innovation & Technology Transfer
  - State of play
  - Challenges and Opportunities
  - Case Study: Wind
- Accelerating deployment, enabling partnerships
- Conclusions and policy implications
- Appendix
  - CambridgeIP snapshot
  - Contacts

Climate Change Mitigation & Adaptation Technology exists

UNFCC secretariat report on Technology Needs Assessments (TNAs) 2009:

- ✓ Mitigation technologies
  - Energy; Agriculture & Forestry; Transport; Industry; Waste Management
- ✓ Adaptation technologies
  - Agriculture and Forestry; Costal Zone; Systematic monitoring; Health; Natural disasters

"The problem of climate change is solvable – many of the technologies required are available today while others can be developed if the right incentives are in place."

-The Copenhagen Communiqué, Corporate Leaders Group, Prince of Wales Trust

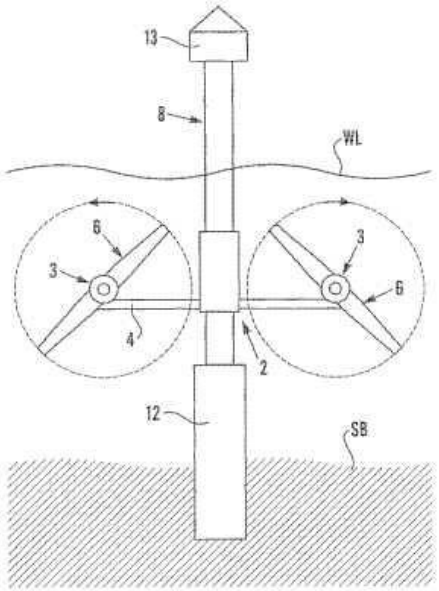
The patent system represents a significant global technological library

- Patents as data are:
  - Structured
  - Comparable
  - Objective
  - Information rich

- Multiple patent data sources are available (an opportunity and a challenge!)
  - USPTO
  - Espace.net
  - Google Patents
  - Boliven.com
  - Specialists like CambridgeIP

A wealth of knowledge is available in the patent literature

- Patents provide
  - Specifications of technologies, and their uses, with technical diagrams
  - Information on the relationships between technologies, and the R&D relationships underpinning developments and their intensity
  - Details of innovators and their research relationships



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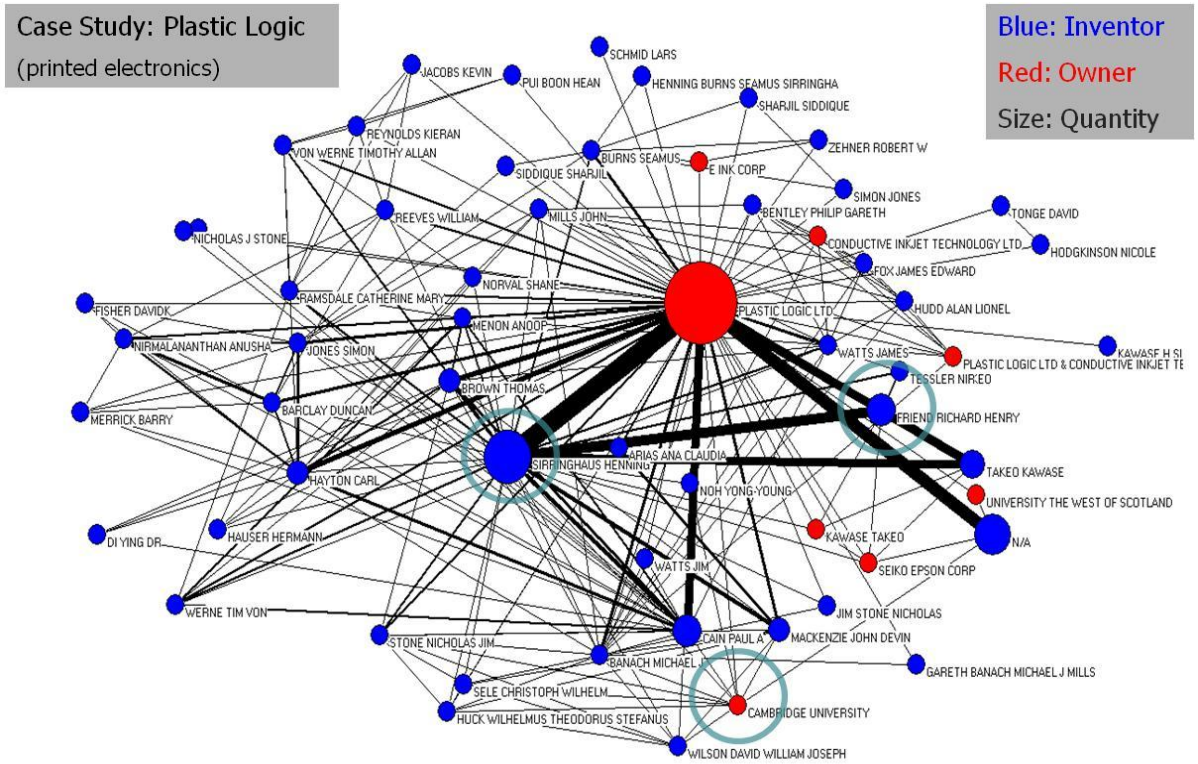
Marine turbine support structure with vertically displaceable mounting arrangement



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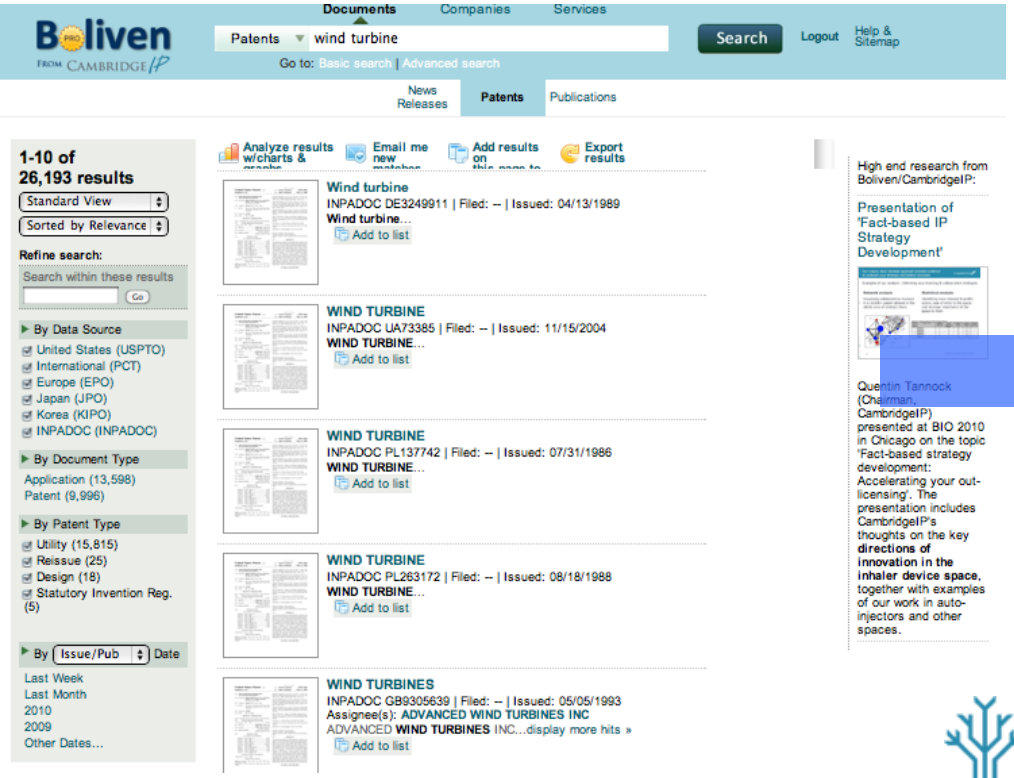
The role of knowledge-management platforms

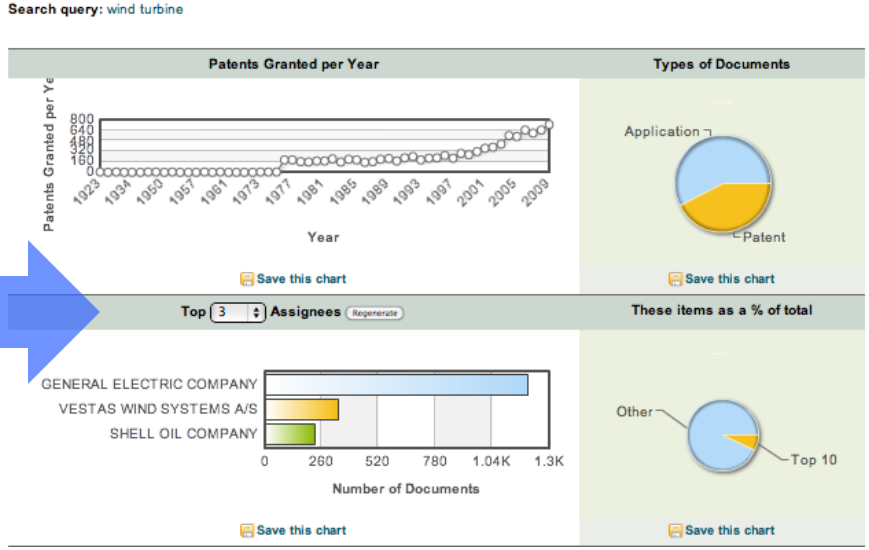
e.g. Boliven.com:

- **Search** technology: Facilitating **access** to information
- **Analysis** tools: Enabling detailed **understanding**
- **Collaboration** platform: Facilitating knowledge **transfer**

Search literature & access full results



Undertake your own analysis: e.g. trends over time, top corporations



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Chatham House and CambridgeIP have developed a patent database focused on six energy technologies

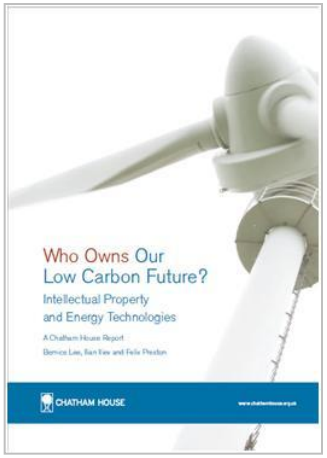
A recent patent landscaping research effort by CambridgeIP and Chatham House, regularly updated by CambridgeIP, has sought to identify:

Facts on the ground – to move beyond myths and to practical solutions

Building blocks for technology transfer practices in the low-carbon energy space

Chatham House and CambridgeIP have developed a unique collection of 57,000 patents and related analyses focused on 6 areas of energy technology

- Biomass to Electricity
- Carbon Capture
- Cleaner Coal
- Concentrated Solar Thermal (CST)
- Solar PV
- Wind



Following the patent landscaping exercise, Ilien Iliev of CambridgeIP co-authored a report with Bernice Lee and Felix Preston of Chatham House: **Who Owns Our Low Carbon Future?**

Full report available for download at Chatham House's website: www.chathamhouse.org.uk

Apart from wind and solar PV, patenting activities growth in other cleaner energy sectors are surprisingly sluggish

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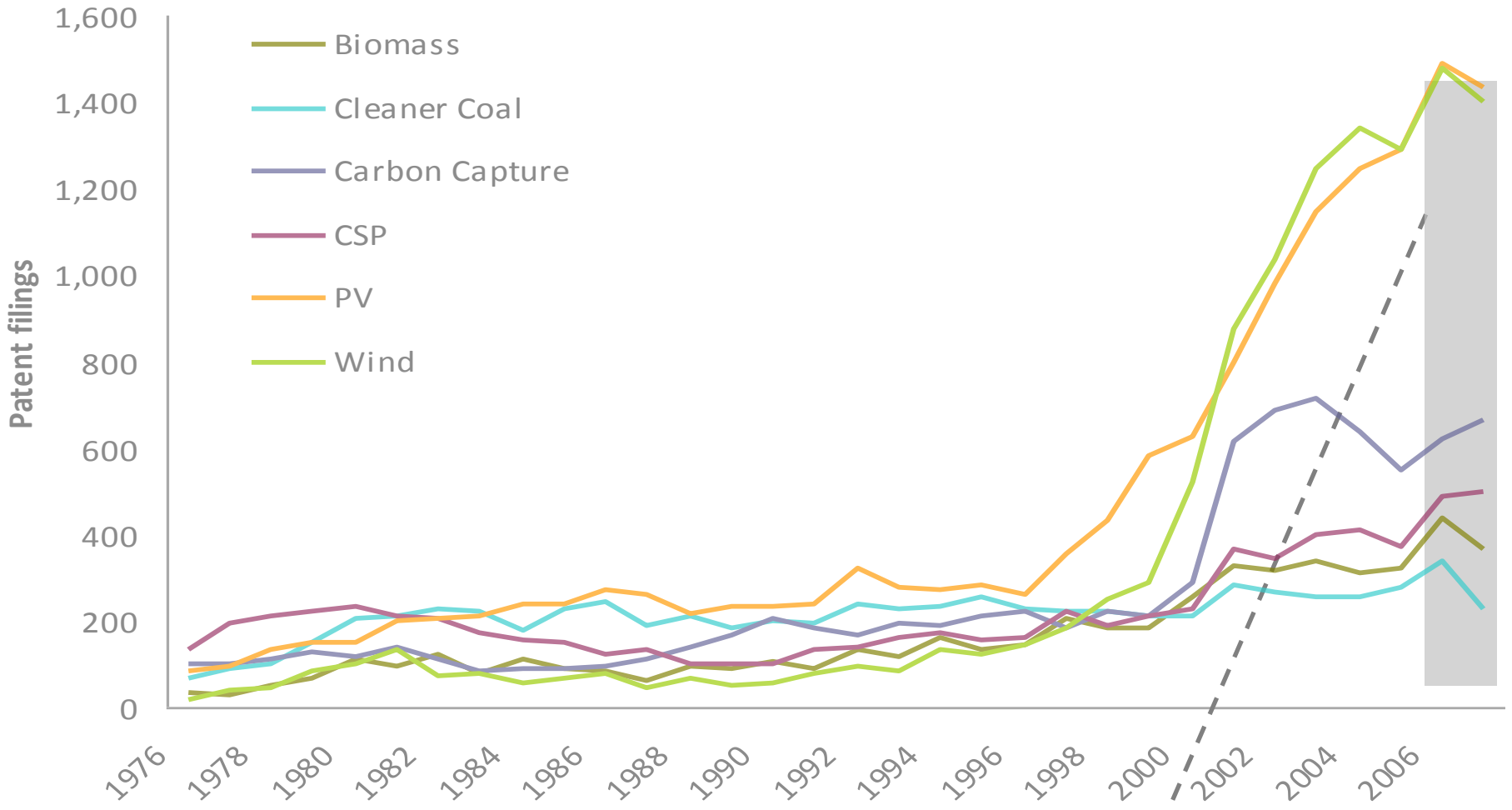

Patent applications may be unpublished for 18+ months. Therefore the number of reported patents for the last 2 years may be under-represented.

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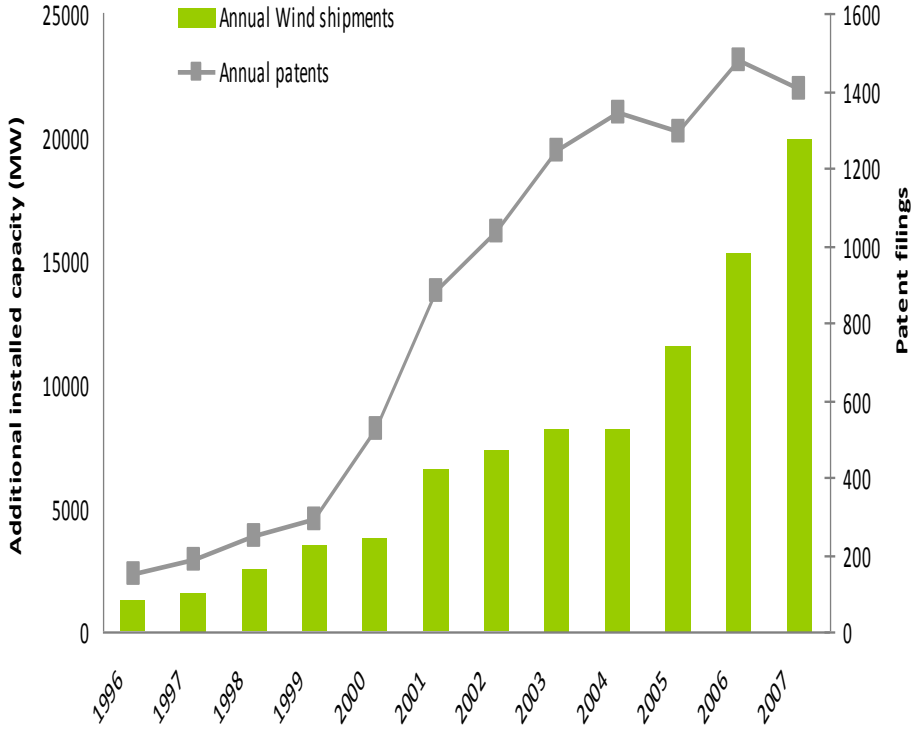
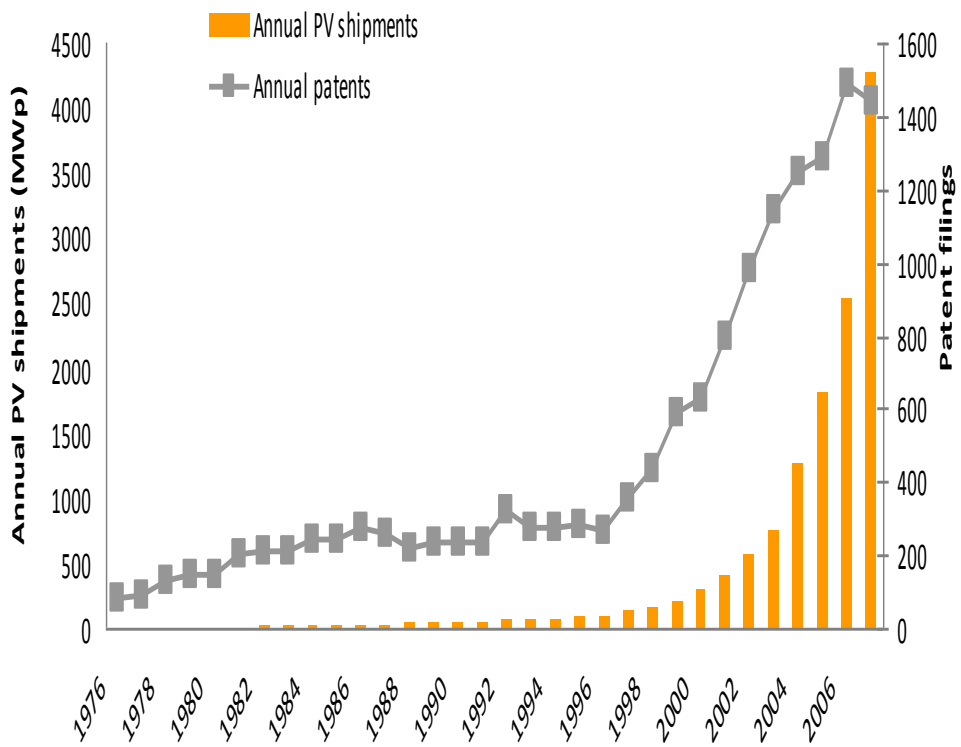
Policy works. Patenting has generally grown with deployment rate

Wind



Solar PV



Sub-sector analysis indicates where value of inventions resides within these complex technology systems

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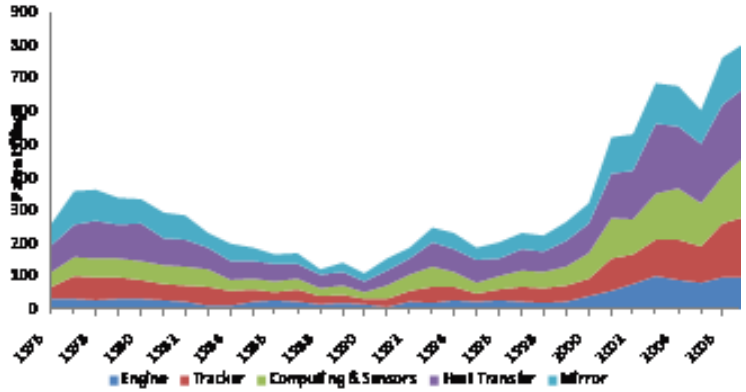
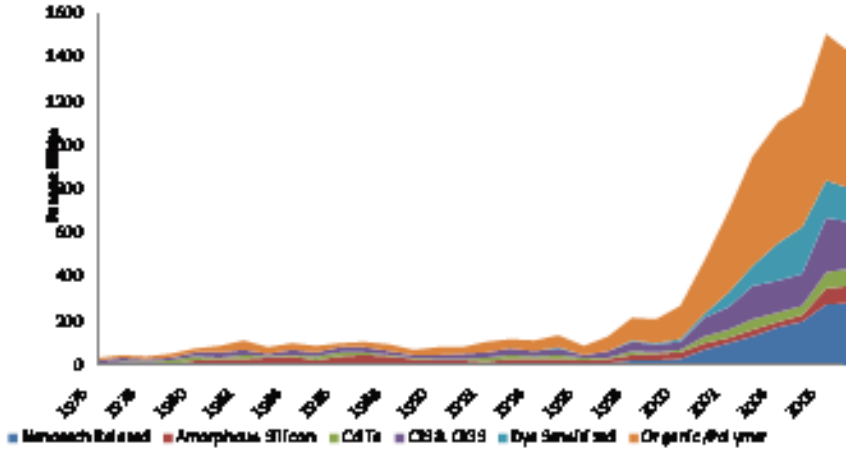
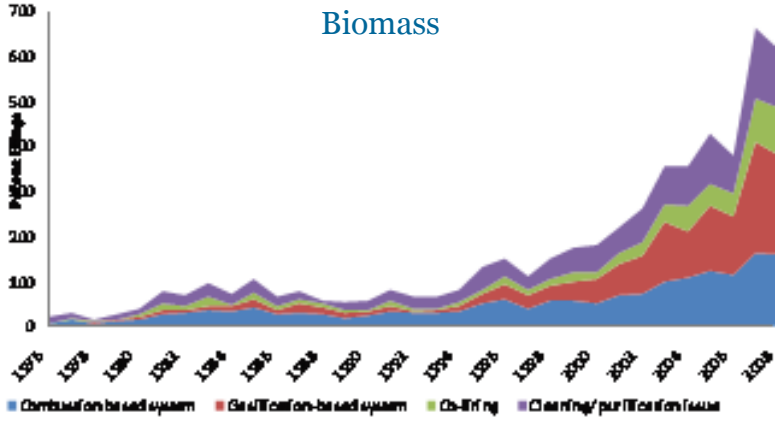
CSP

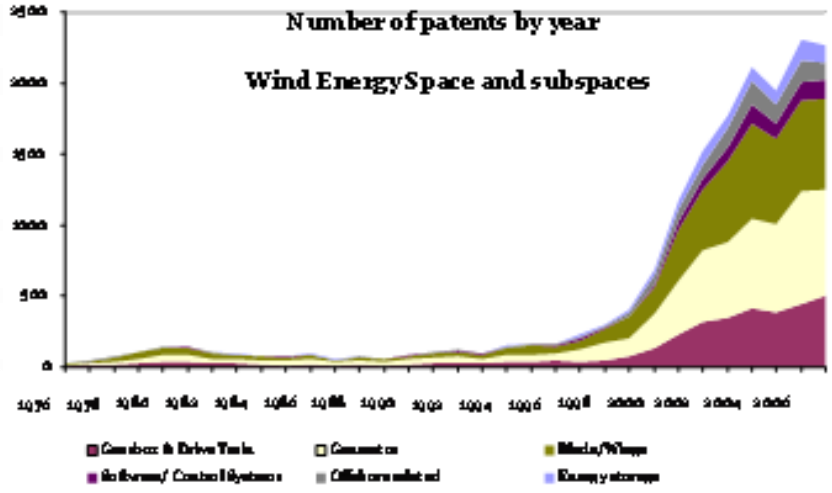


Solar PV



Biomass





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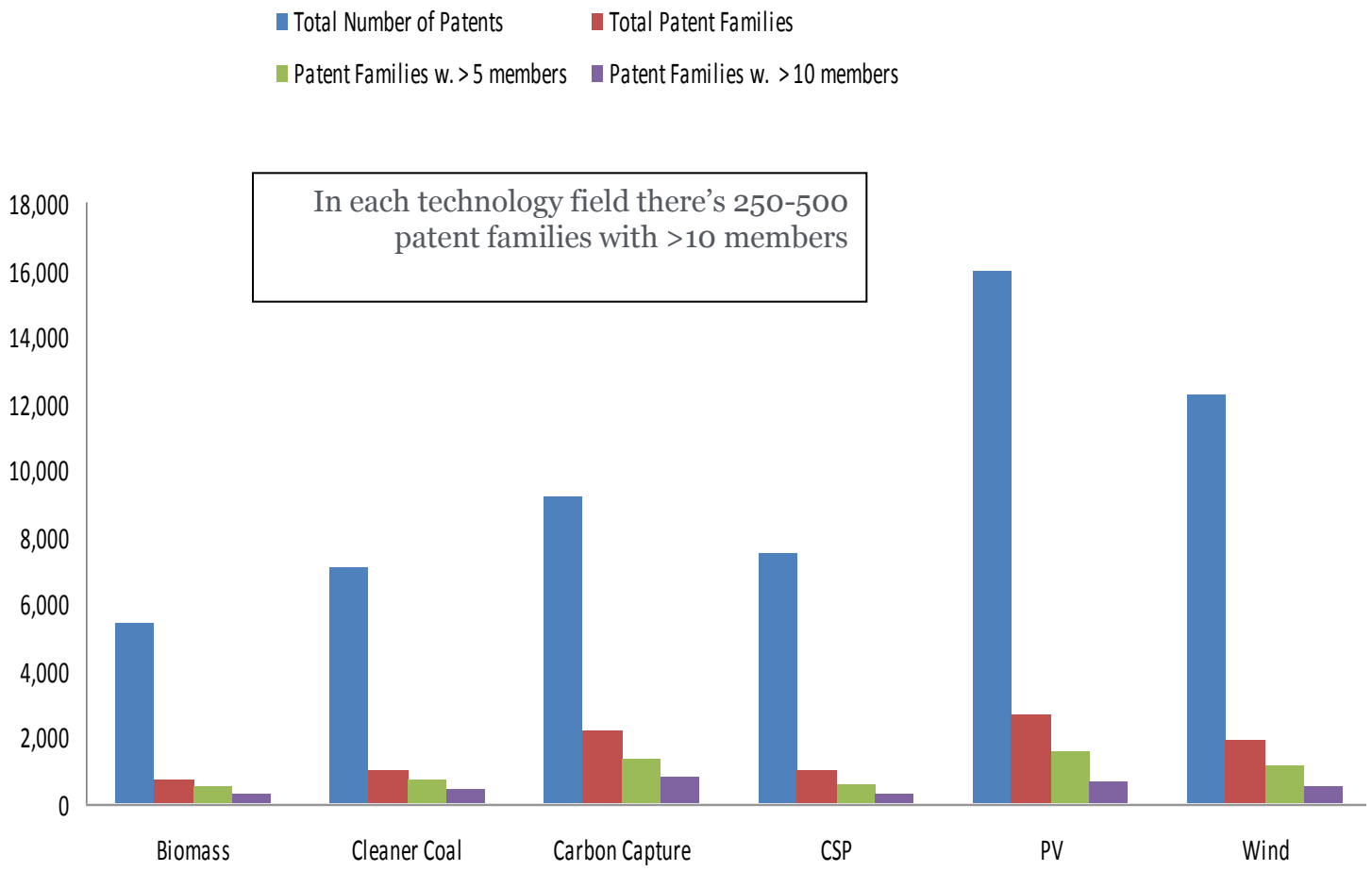
Patent families and Patent citations: Commercial value?

- **Patent family size** can provide an indication of the commercial value of a patented innovation: Most commercial value is concentrated in a relatively small number of patent families

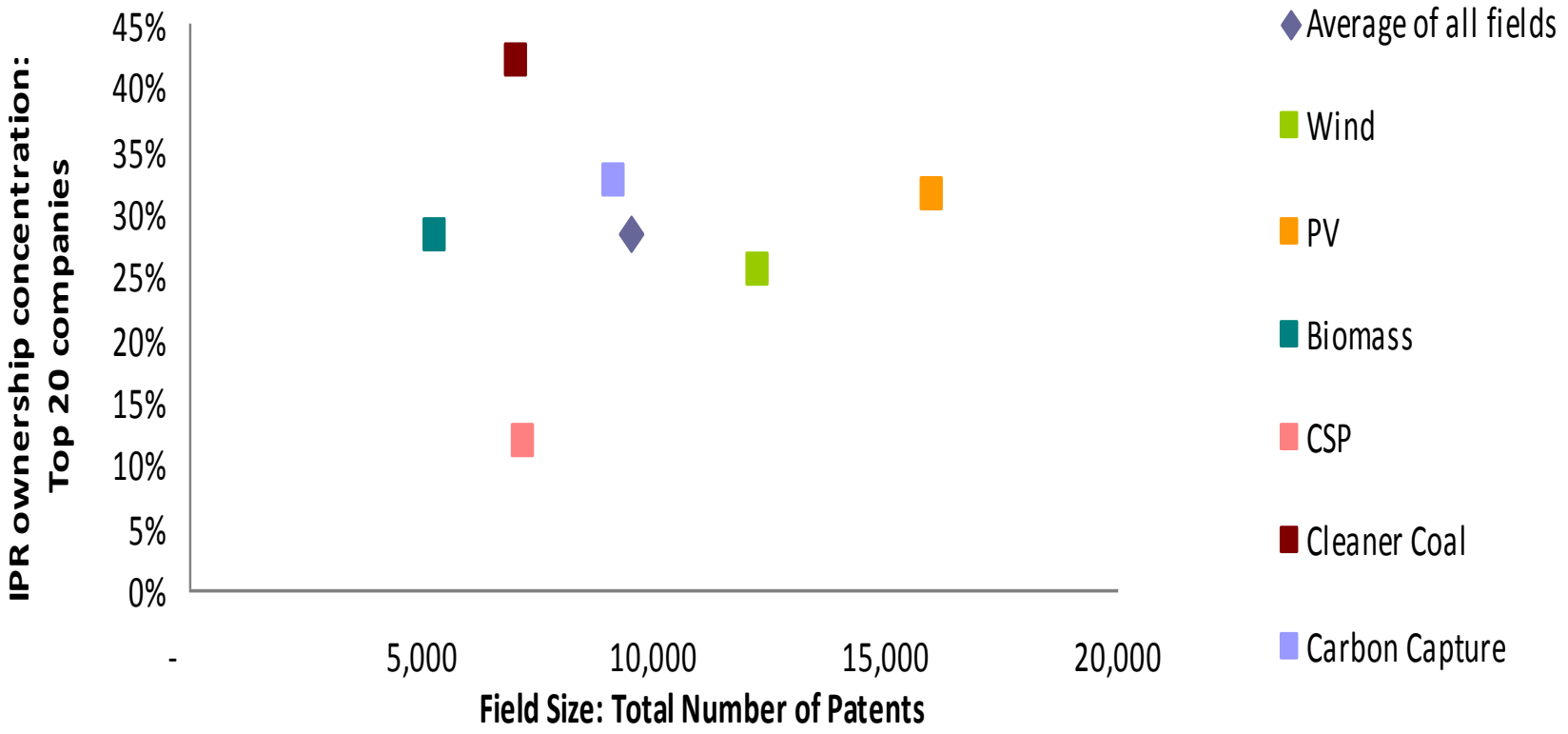


Patent citations can indicate the commercial and scientific relevance of patented developments: Our research with Chatham House shows that it takes between 19 to 30 years for top cited low carbon technologies to reach the 'mass adoption' phase.

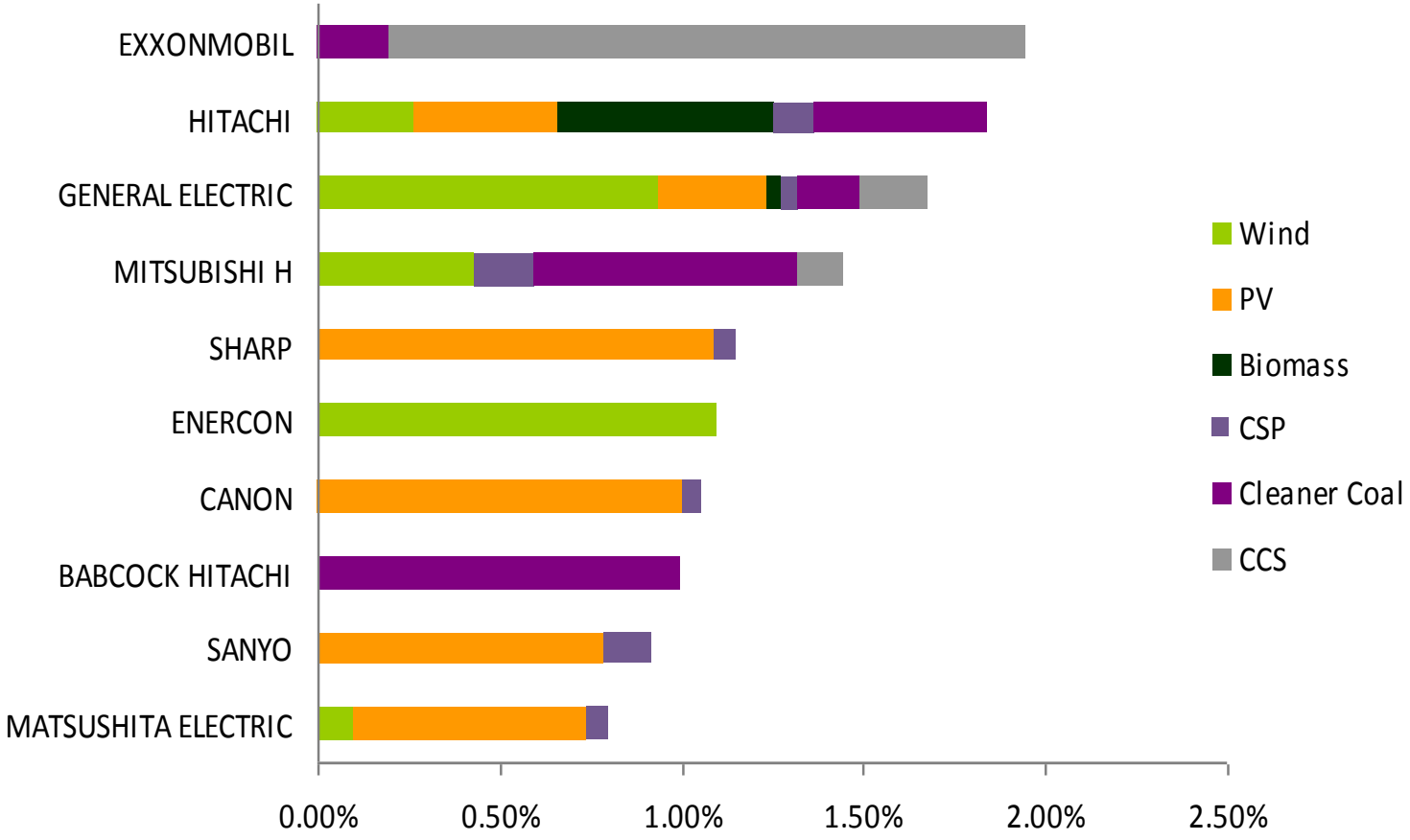
Harvard Business Review

Patent ownership concentration rates: What does it tell us?

The concentration of patent ownership cannot be assumed to be synonymous with a lack of competition or a monopoly: but it can slow innovation and diffusion in some types of markets depending on underlying business models.

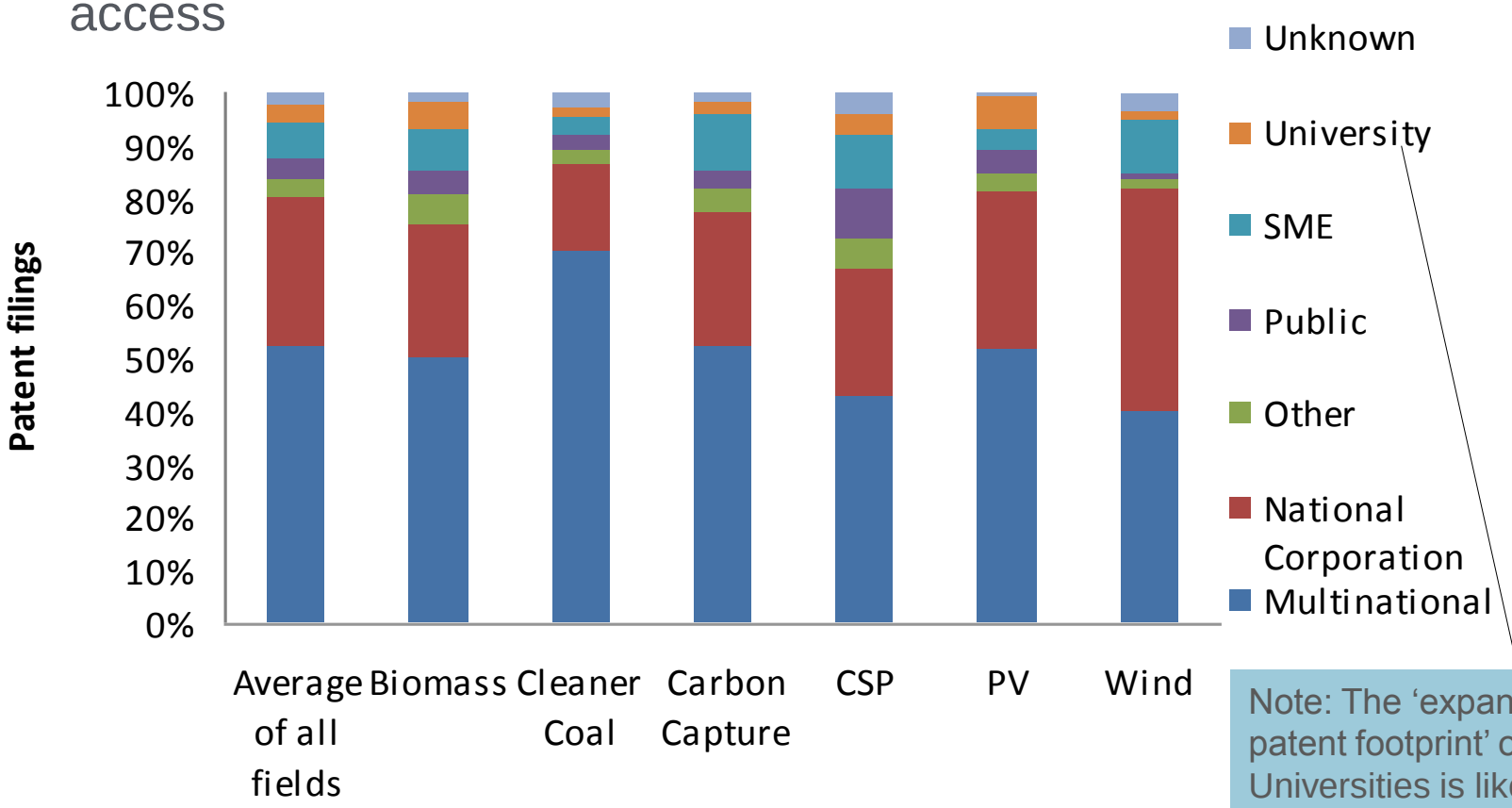


High-carbon companies control some of the key knowledge assets underpinning the low carbon economy



The public sector is a key actor, and its role is likely to expand

- Public-institution owned IP may be the easiest point at which we can implement innovative licensing practices
- University and SME owned IP might also be relatively easy to access



Note: The 'expanded patent footprint' of Universities is likely to be much higher due to tech. licensing and spin-off/out activities

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Wind Energy: A range of applicable IPRs

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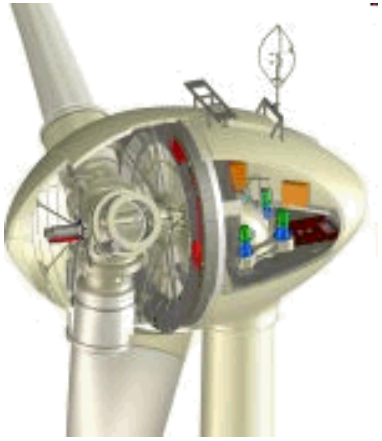
Modern technology products are protected by a range of IPRs



Patent: Prevent others from using your technology for a limited time E.g. Patents covering energy conversion

Trade Secret: Protecting critical know-how. E.g. Details of optimum system parameters

Copyright: Protecting the form of expression. E.g. Control software for Wind

Trademark: Protection of a word/symbol denoting origin of product9s) e.g. SUZLON brand name

Design rights: Prevent others from using specific physical forms / characteristics of your technology E.g. Shape, texture & materials

Wind Energy: Technology system & Value chain

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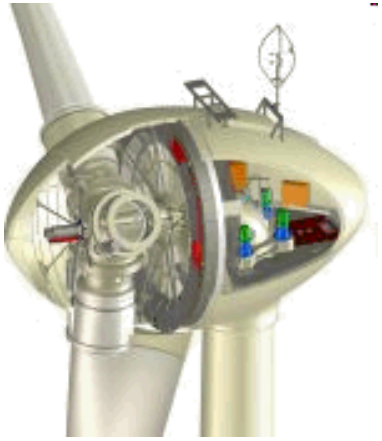
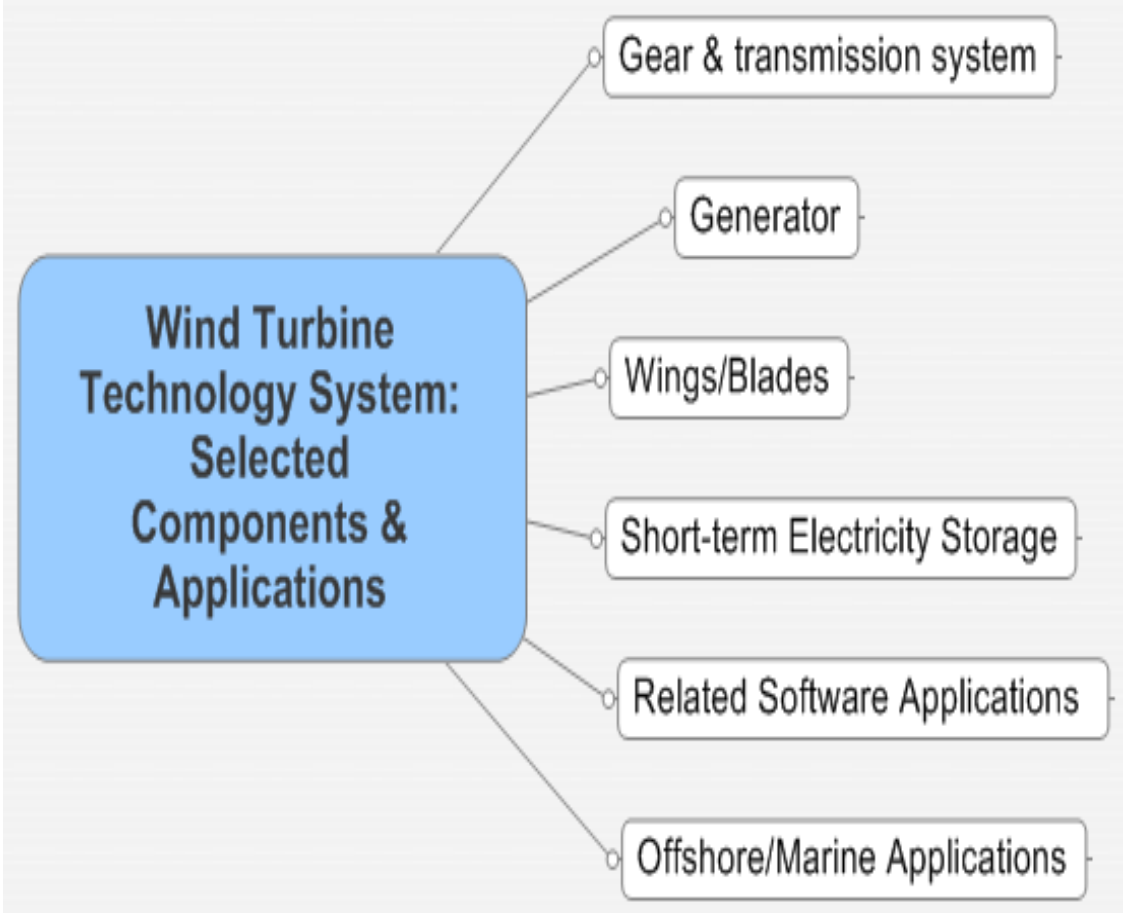
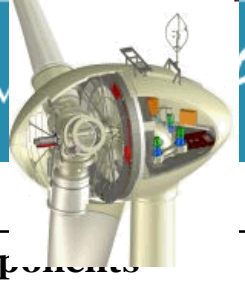
Wind turbines are *complex* technology *systems*



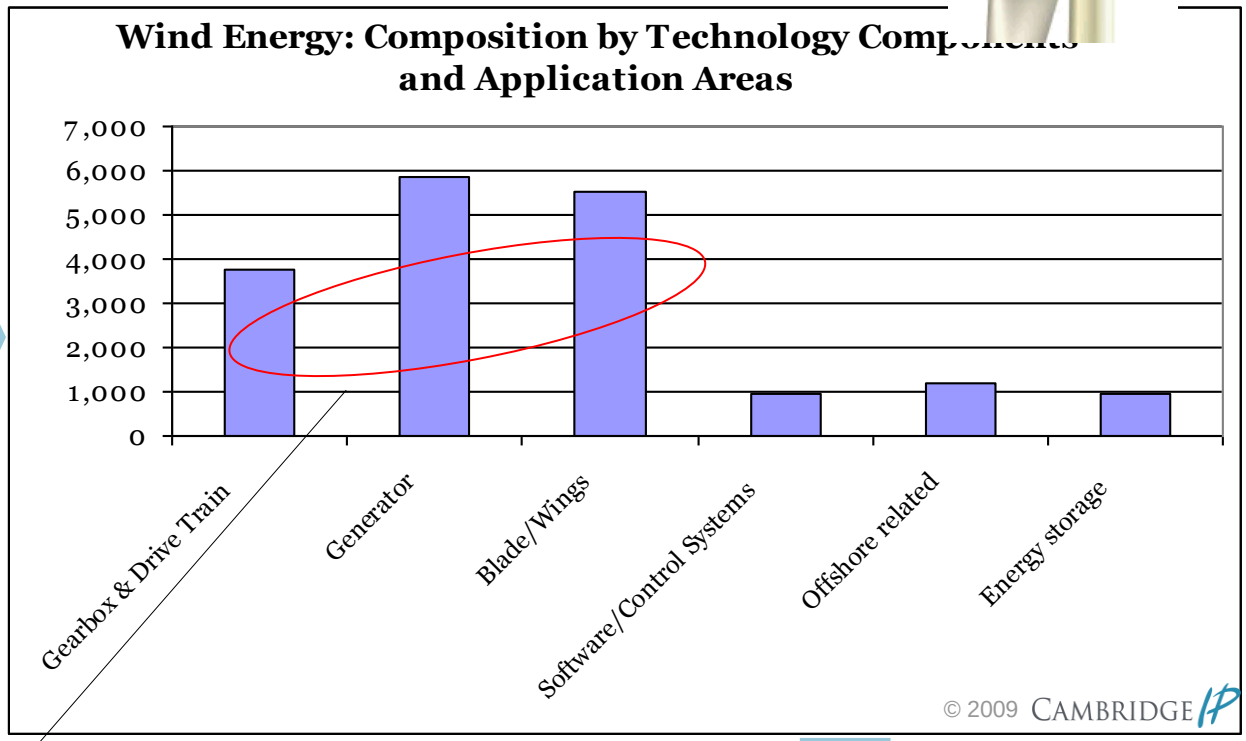


Value chains are diverse: Various system components can be sourced from numerous industry sectors and a range of company types within these sectors. E.g. Wing/Blade technology from Aerospace sector, Electronic components from Electronics sector

Wind Energy: Key Components & Applications



Components or application level analysis can help us identify core areas of innovation, or where new activities are emerging



There are significant overlaps between some of these sub-spaces: revealing patents with multiple or systems-level claims

The complexity of underlying technology systems and diversity of industry sectors / value chains can make identifying appropriate interventions challenging

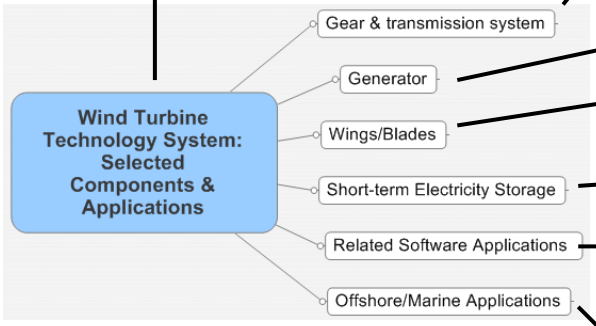
Wind Energy: Top IP Owners

It is of interest to understand the extent to which the value chain is 'owned' or controlled by the top organisations overall: are there areas where new entrants are making an impact?

Wind – Overall space
Enercon
General Electric
Vestas Wind System
Mitsubishi
LM Glasfibre

Gearbox
General Electric
Vestas Wind System
Enercon
NTN
Hansen Transmission

Generator
Enercon
General Electric
Mitsubishi
Hitachi
Vestas Wind Systems



Blade/wings
Enercon
General Electric
Vestas Wind Systems
LM Glasfiber
Mitsubishi

Energy Storage
General Electric
ABB
VRB Power Systems
Hitatchi
Canon

Software/Control Systems
General Electric
ABB
Vestas Wind Systems
Siemens
Repower Systems

Offshore related
Enercon
Aerodyn Engineering
General Electric
ABB
Vestas Wind Systems

Suzlon case study: India

- Indian wind turbine manufacturer
  - Established in 1995 with 20 people
  - Now employs 14,000 in 21 countries
  - Market leader in India (which is 5th globally in installed Wind), 3rd largest wind turbine manufacturer in the world

- Strategy of acquiring leading European technology companies (and their IP) in the space…
  - Rotor-blade design house: AE Roter Techniek (2000)
  - Gear-transmission systems: Hansen International (2006)
    - Subsequently sold a large stake in Hansen International (2009) but retained IP rights
  - Turbine manufacturer: RePower (2009)
  - Now has 12.3% of global wind turbine market globally
- … and manufacturing from a low-cost base in India

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Accelerate: Patent pools, cross-licensing & standards

- Pooling, cross-licensing & standards arrangements can accelerate technology innovation and diffusion through, e.g.:
  - Inter-operability of components
  - Non-duplication of R&D efforts
  - Decreased risk of litigation
  - Broadening users and uses results in unexpected and novel uses of technology
- Note: There are many many risks associated with these mechanisms

Telecoms: European Telcoms Standards Institute

Medical Devices: Continua Health Alliance

Health: UNITAID patent pool

Accelerate: Pooling, Cross-licensing & Standards for Green Tech – what next?

- Identify candidate areas for pooling / cross-licensing agreements
  - Likely features: Increasing technical & patent complexity, litigation rates, relatively high speed of technology 'life cycle' (past examples – telecoms & semiconductor sectors)
  - **PV:** e.g. underlying technologies for PV production, business models similar to semi-conductors sector
  - **Cleaner Coal:** e.g. high-end IGCC technology,
  - **Carbon Capture:** e.g. Carbon separation processes – around broad, fundamental technologies (e.g. enzymes-based carbon capture)

- Identify candidate areas for standards agreements
  - Likely features: Increasing technical complexity, diversity of markets and users, requirements for inter-operability (past examples – telecoms & semiconductor sectors)
  - **Wind:** e.g. inter-changeability of components – gear/transmission, software systems, integration with grid
  - **Smartgrid:** e.g. communications protocols/software for smartmeters, hardware

- Confirm there is a 'critical mass' of willing participants?
  - See next slide for some of the **drivers for company participation**
  - **Participants include: Public sector:** Universities, Research institutes, public sector buyers, SMEs; **Private sector:** Procurement strategies (housing builders, utilities), SMEs, Multinationals with compatible IP strategies, other industry technology standards bodies

Accelerate: Why do *companies* enter cross-licensing, pooling & standards arrangements?

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Considerations	*Rationale*	*Examples*
Remain a technology leader	In a rapidly changing industry: remain at the head of technology change	Motorola: semi-conductor cross-licensing
		Nokia: licensing of technology to Siemens
Avoid litigation (defensive and offensive)	Low-cost/reasonable royalties for use of technology: cheaper to license than to risk litigation	Motorola: non-discriminatory/blanket 5-year renewable agreements to both competitors and others
Accelerate innovation	Expose your technology to greater number/type of users	Nokia: licensing of technology to Siemens
Revenue generation	Unilateral licensing out of key IP can generate significant revenues	Motorola: semi-conductor licensing was generating $50mln p.a. in 1990s
		IBM: licensing out of IP that's not being used: 100s $mln p.a.
Protect value chain against major outsider entrants	Meet challenge to leadership *outside* of industry – retain leadership of the industry	Nokia licensing of S60 platform to counter Windows Mobile entry threat
		Symbian Foundation: royalty-free licensing model to protect against Google Android & Apple
'Increasing the size of the pie'	Change model to redefine the market boundaries & increase services accessible on back of platform	Revenue sources for Smartphones are changing from calls to data and content – even payment services (e.g. Visa mobile payments solutions)

Accelerate: Some of my suggestions – 'low hanging fruit'

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- Invest in developing **model contracts** for R&D collaboration, IP acquisition and licensing
  - Transactional costs are reduced when parties can work from standard model templates, negotiations start from a fair and well-understood basis
  - A good example are the 'Lambert' Agreements implemented by the UK government for University/Industry R&D collaborations
- Expand **'Green fast-track' Patent Office** initiatives
  - E.g. UK IPO's 'fast track for Green patents initiative: See our Blog article on this topic here - www.cambridgeip.com/blog/archives/102.html
- 'Tag' **patents available for licensing** in Patent Office online databases
  - Patent owners could opt in to have their patents 'tagged' as available for sale or license
  - Information on contact details and commercial terms could be provided, speeding negotiations
- Capitalize on the existing, massive, **global technology library** represented by over 50 million patent documents – it's currently under-utilised
  - Sectoral mapping & multi-ontology database creation
  - Technology mapping: IP Landscapes ®

Accelerate: Some of my suggestions – 'higher fruit'

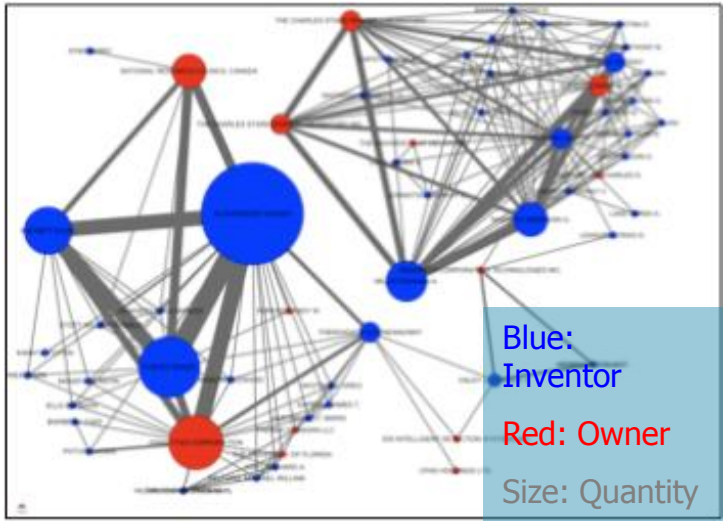
- Encourage **private sector investment** e.g. by supporting the creation of investment 'platforms'
  - E.g. Low Carbon Investment Indices with major bank participation
- Establish **databases on licensing terms** & leading practice in key sectors/industries
  - Establish benchmarks, encourage transparency & standardisation, share leading practices
  - Organisations like WIPO might play a role, and licensing terms could be published in the database
- **Manage risk** through the establishment of insurance options
  - E.g. Insurance to manage IP litigation risk in key technology-market sectors
- Adopt **Alternative Dispute Resolution** (ADR) measures to set 'fair and reasonable' (FRAND) licence terms
  - E.g. Mediation, Expert Determination, Arbitration

Enable: Expertise is required

- Even in mature, well-understood, market-technology sectors there is a need for expertise to adapt & deploy technologies
- Challenge: Identify and engage with willing experts
  - ✓ IP data can help identify most the prolific and most networked experts in technology spaces
  - ✓ Platforms like Boliven.com house Innovation Networks™ where experts are grouped (and group themselves)

Network analysis

Visualising collaborations revealed in a 10,000+ patent dataset in an area of strategic focus



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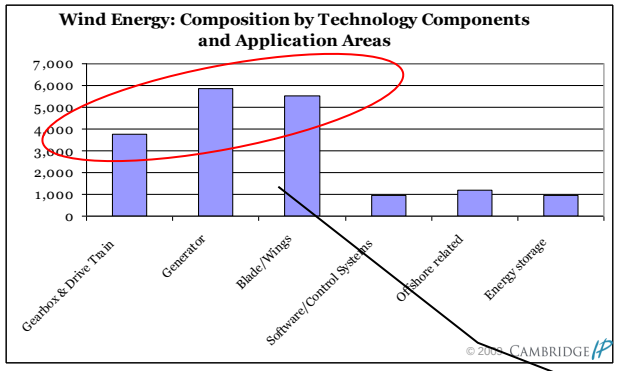
Challenges: Adoption, Deployment, Integration

- **Integration challenges**
  - Tech. Sectors and Value Chains are diverse
  - Many solutions require integration & inter-operability
  - High-carbon companies control some of the key knowledge assets underpinning the low carbon economy, but not exlusively
- **Deployment is too slow**: Accelerating deployment of existing technologies?
  - Our research shows that it takes between 19 to 30 years for top cited low carbon technologies to reach the mass adoption phase (CambridgeIP, Chatham House: 2009)
  - Some technologies, and business models, are 'young' and consequently relatively fragile
    - Commercial confidence is lacking: Increases the positive impact of public procurements & market guarantees (like Feed In Tariffs)
    - Technology transfer 'leading practice' and standard terms are often not yet established (what is 'fair and reasonable' is not yet known)
    - In some sub-sectors there is a fear of patent litigation
- **International dimensions can be complex**
  - Technology supply and demand is global E.g. Even where technology is not internationally created, it is internationally deployed usually with local distribution/technology partners
  - We see enormous opportunities for developed and developing countries to develop world leadership



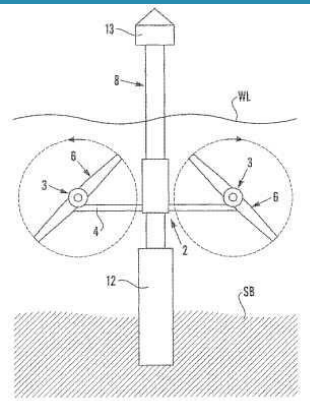
There are significant overlaps between some of these sub-spaces: revealing patents with multiple or systems-level claims

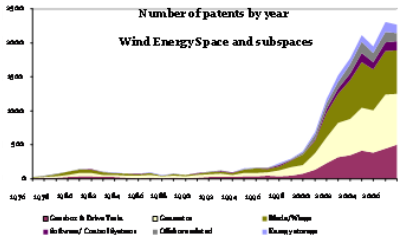
Policy implications: Some specific considerations

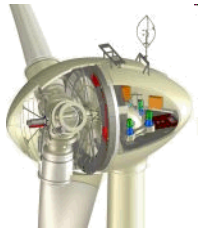
- **Multiplier effect**: High degree of cross-over from technology in once space to another
  - E.g. Plane wing materials become Wind blades; Biotech becomes Biofuels
- **Inter-operability**: Many CleanTech solutions require technology integration, global 'roll-out' implies standardisation
  - E.g. Wind turbines have many complex components, produced by various suppliers who are often located in different countries
- **Diverse players**: Wide range of types of technology owner, and concentration of technology ownership across different technology sectors
  - E.g. Patent ownership is concentrated with incumbents in established spaces (such as CCS, Super Critical Coal) and is more dispersed in emerging spaces (such as Wind)
- **Litigation risks**: There is an increasing risk of IP related litigation as markets mature (e.g. Wind, PV)

Some conclusions (1)

- Together, patents represent a global technology library
  - ✓Accessing information & transferring knowledge from this library is facilitated by a range of tools and services
  - ✓Analysis tools, and relevant expertise, remain critical for effective access to information. The underlying data is of vast quantity, wide quality range and is technically complex.

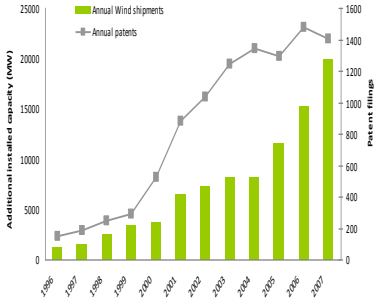


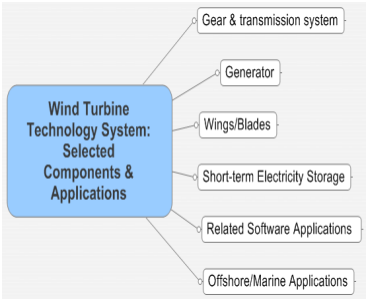


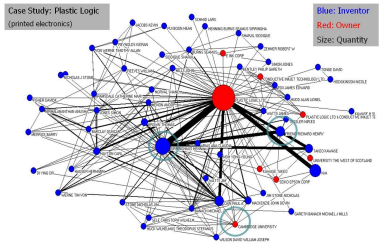


Some conclusions (2)

- Climate Change ‘Adaptation’ and ‘Mitigation’ technologies exist but deployment is complex and takes far too long
  - ✓ Policy-makers should develop ‘smart’ IP and innovation policies that take into account both the complexity of underlying technology systems *and* supply/use sector diversity… This is ‘easier said than done’!
  - ✓ Innovation & technology transfer are important, but so is the transfer of enabling know-how / show-how – people need to implement and use the technologies developed. Expert identification and establishing expert networks will be important.







Boliven.com CAMBRIDGE IP

Acknowledgements

– The entire team and especially contributions by my colleagues, Ilian Iliev and Helena van der Merwe

– Bernice Lee and Felix Preston

- Read the Chatham House / CambridgeIP report: Who Owns Our Low Carbon Future? Intellectual Property and Energy Technologies (download from www.chathamhouse.org.uk)

Outline: Climate change - Innovations & partnership models

- The Global Technology Library
- Intelligent knowledge transfer
- Innovation & Technology Transfer: Climate change
- Conclusions and policy implications
- Appendix
  - CambridgeIP snapshot
  - Contacts

Our offerings

IP Landscape®	Open innovation	Technology mapping	Technology market review	Boliven.com Cambridge IP
Expert built patent datasets focused on your technology	Identify technology ownership in complex spaces	Pinpoint emerging technology patterns & hotspots	Identify market – technology niches in rapidly developing markets	**Knowledge transfer portal** Access over 100 million scientific documents, including the latest patents
Identify prior art in a technology space	Shortlist acquisition opportunities	Understand technology value chains	Inform in-house R&D strategy	Conduct technology literature searches
Uncover inventor & collaborator networks	Identify overlaps with your own technology portfolio	Identify technology market & commercialisation scenarios	Influence public sector innovation support strategies	Perform high-level analytics on patent data
Clarify strengths & weaknesses of patent portfolios	Conduct due diligence on external partners	Locate prospective partners, acquisitions and clients	Prioritise key market segments and identify strategic partners & collaboration opportunities	Collaborative patent landscaping with your colleagues
Confirm freedom to operate & technology white space analyses	Identify open innovation opportunities in your own and others' IP portfolios	Information on partner/acquisition candidates operating in your area of interest	Identify in what areas you need to build an IP Landscape	**Boliven Landscapes** Access valuable patent datasets combined with industry expert analyses
Support investment due diligence and preparation for fund raising	CxO compatible materials, workshops and seminars			
Understand market trends				

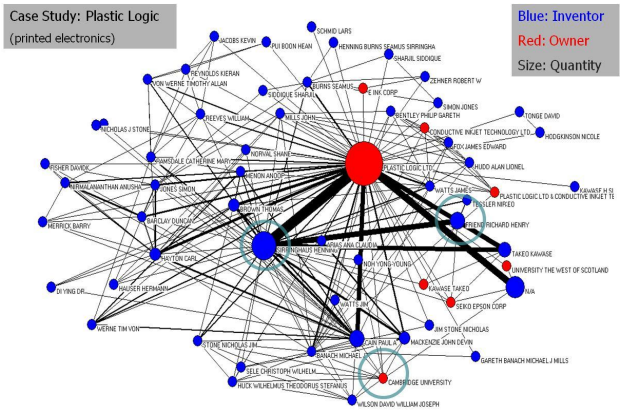
IP Landscape ® reports: informing IP, R&D and investment strategy

CAMBRIDGE IP

CambridgeIP's IP Landscape® report standard informs:

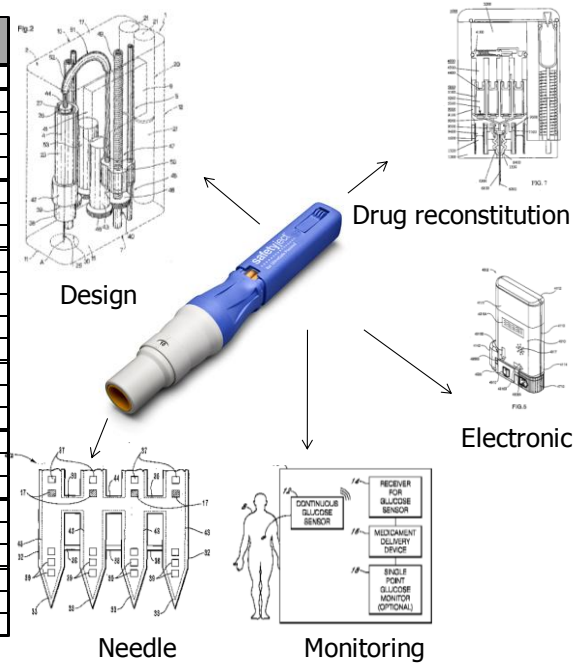
- IP strategy development and execution
- Development of freedom to operate (FTO) and white space analyses
- Investors' due diligence and strategic overview of a space
- Identify prior art in a space

Inventor and collaborator networks

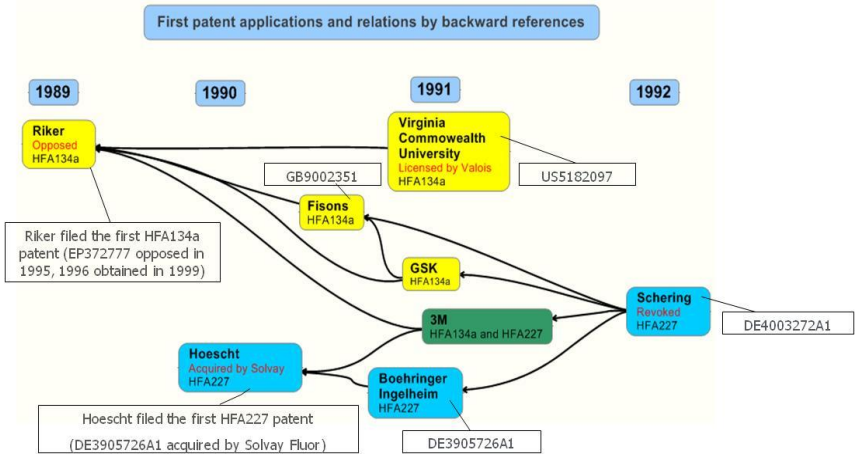


Decomposition of complex products and processes drives an intelligent patent research program

	Needle Free injector	Pen Shape	Electronic AutoInjector
Disposable	x	x	
Cartridge	x	x	x
Drug Mixing	x	x	x
Single dose	x	x	x
Multi Dose	x		x
Needle	x	x	x
Retractable	x	x	x
Shield	x	x	x
Piston	x	x	x
Spring	x	x	x
High Pressure	x	x	x
Pump	x	x	x
Air Jet	x		
Display	x	x	x
LCD Screen	x	x	x
Mechanical	x	x	x
Auto-Activation	x	x	x
Mechanic	x	x	x
Sensor	x	x	x
Data Storage	x	x	x
Mechanic	x	x	x
Electronic	x	x	x
Dose control	x	x	x
Mechanic	x	x	x
Electronic	x	x	x



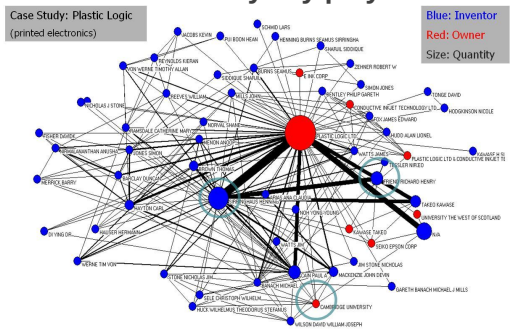
Prior art analysis helps identify key IP risks in a space



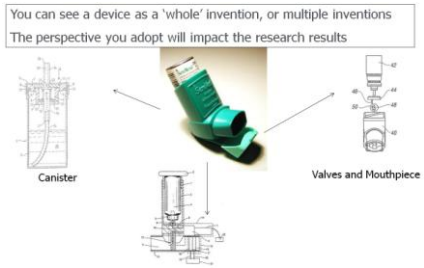
CambridgeIP and open innovation

- ✓ Fact-based technology intelligence through science literature analysis and expert interviews
  - ✓ Identify key players, R&D relationships and their intensity
  - ✓ Find relevant technology examples, diagrams and descriptions
  - ✓ Understand trends by technology, geography, application and other factors
  - ✓ Confirm freedom to operate and identify expired/abandoned patents
  - ✓ Inform IP and technology valuations

Identify key players



- ✓ Expert partnering, M&A and IP acquisition advice and contacts derived in over 120 major technology scouting and technology mapping projects
  - ✓ Expert in decomposing products into their component parts and identifying technology ownership, overlapping technology areas and cross-over technologies
  - ✓ Rapid identification of IP-related strengths and weaknesses that can be exploited/plugged with open innovation techniques
  - ✓ Our understanding of the technology trends and activity of key players helps inform your open innovation and partnering strategy
  - ✓ Due diligence on external partners and technologies



- ✓ CxO compatible materials, workshops and seminars
  - ✓ Accelerating internal communication
  - ✓ Facilitating effective technology transfer

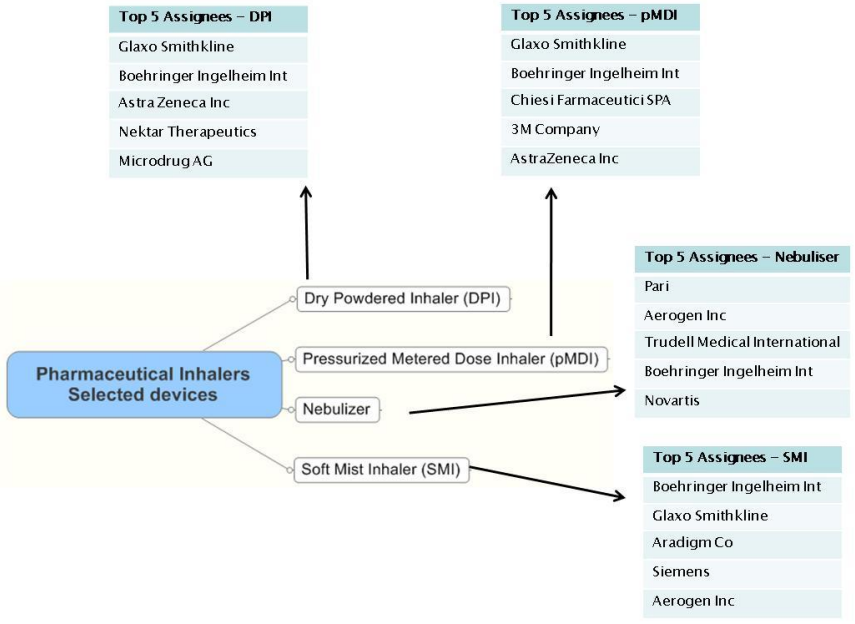
Which technology components are you ready to license out? Which ones should you acquire?

Competitive intelligence

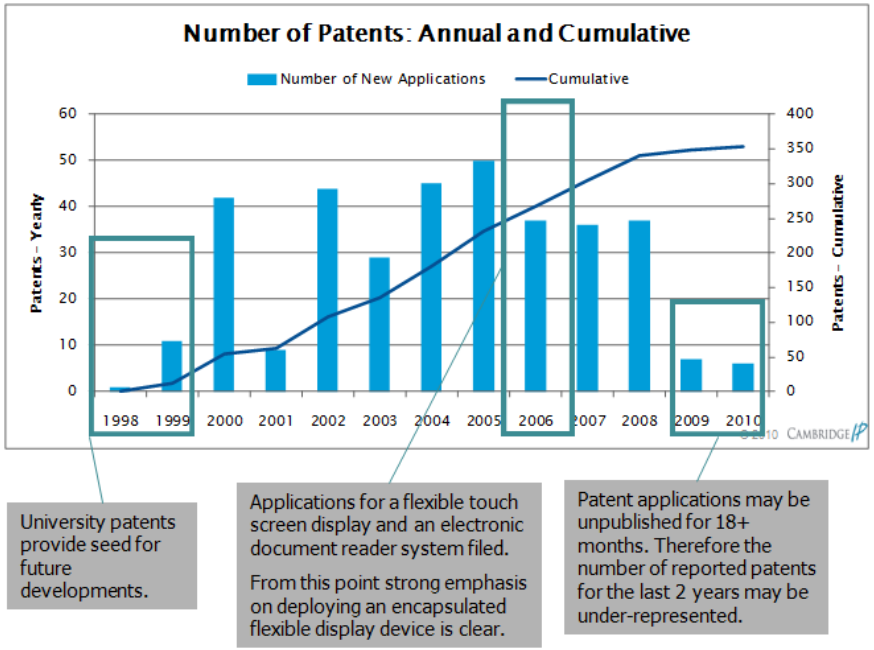
Key benchmarks and comparisons against key competitors or alliances

- Strengths and weaknesses of patent portfolios
- Inventor and collaborator networks
- Evolution of R&D focus
- Technology value chain mapping

Technology value chain mapping



Evolution of R&D focus

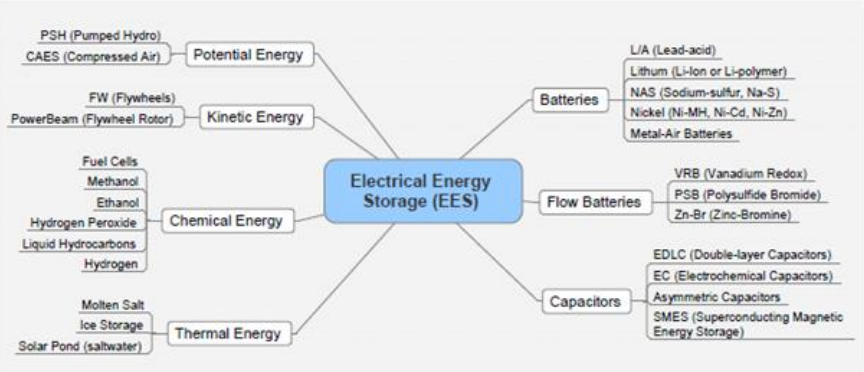


Technology foresight

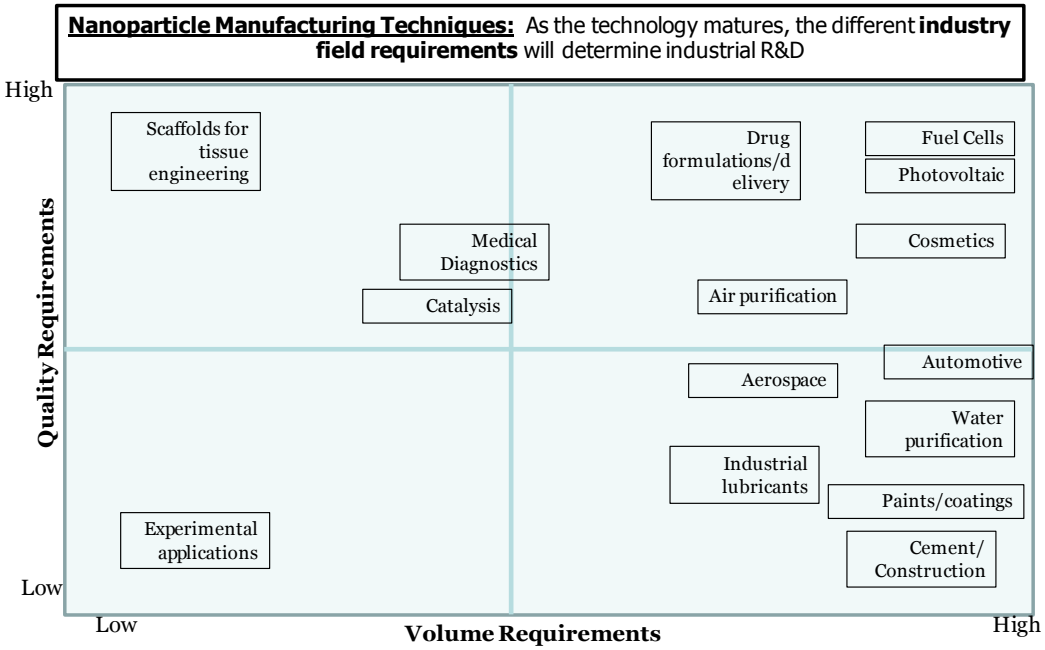
Technology foresight activities helping you identify:

- Emerging technology trends
- Industry white space analysis
- Investment opportunities
- Key technology market scenarios

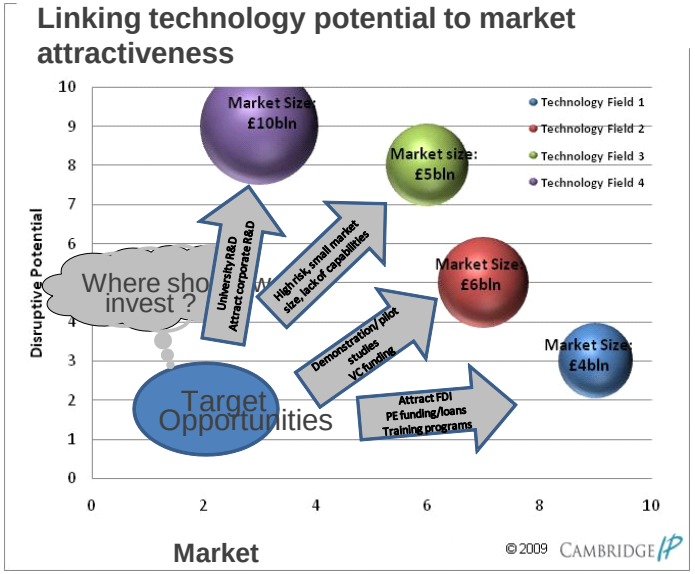
Emerging technologies in electrical energy storage



Technology maturity and market requirements drive likely market adoption



Linking technology potential to market attractiveness

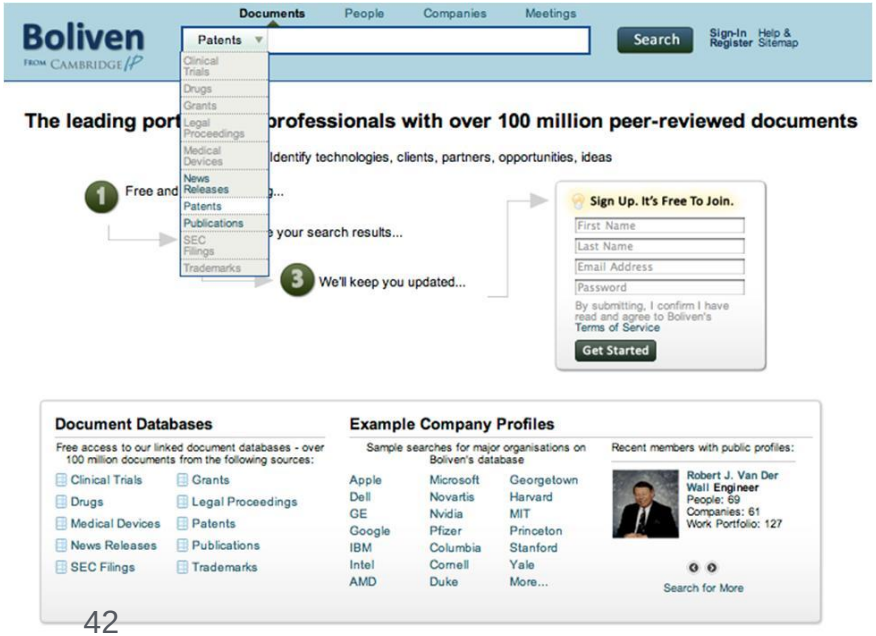


CambridgeIP's technology and knowledge platforms

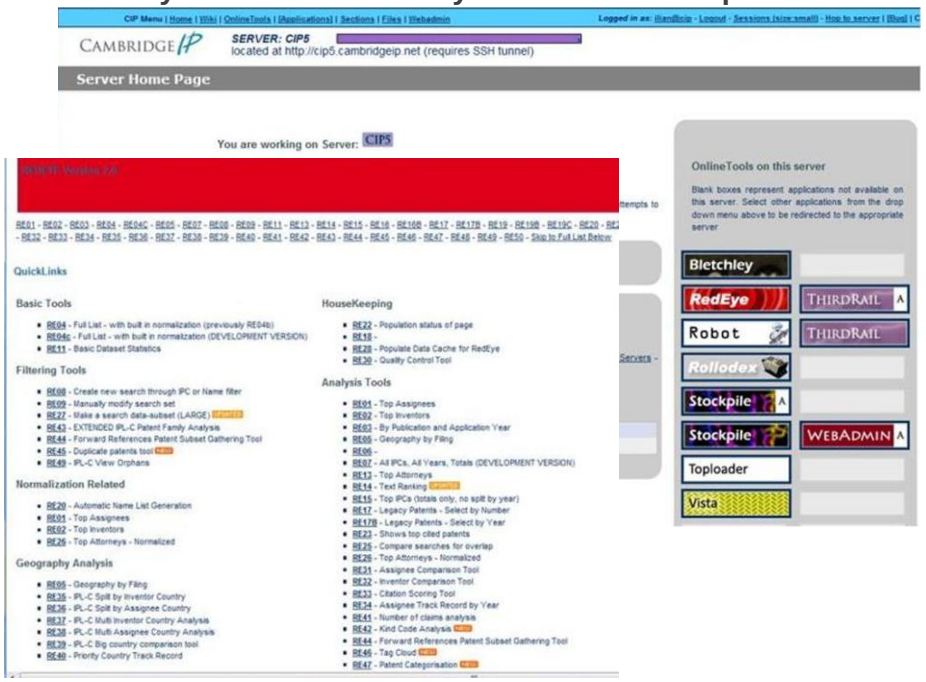
CambridgeIP's offerings are based on a combination of:

- Proprietary software and workflow platforms tested through more than 100 real life projects
- A 100 million document database of patent and non-patent literature
- Quality assurance and report standards that ensure consistency in the outputs for our clients
- The Boliven.com online platform of technology literature search and analytics with 8,000+ registered users and 30,000+ unique visitors per month

Boliven.com: a leading portal for R&D and IP professionals



RedEye: our software analytics and workflow platform



Outline: Climate change - Innovations & partnership models

- CambridgeIP snapshot
- CambridgeIP experience
- CambridgeIP team
- Contacts

Our clients

Selected clients:

We have delivered more than 120 projects with leading organisations including major corporations, research institutes, service providers, high-tech SMEs and investors. Below is a selection.

Roche

Cambridge Consultants

Climate Strategies

The Open University

TAQA

novexin

ALLEN & OVERY

Orthomimetics

OWLSTONE

Integrated Products Manufacturing
Knowledge Transfer Network

CHATHAM HOUSE

PRAXIS

Imperial innovations

Selected experience:

CambridgeIP is a recognised thought leader in the technology intelligence space. Our research has been covered by the *Harvard Business Review*, *Financial Times* and other leading media. Our collaborations include *Chatham House*, *University of Sussex* and *Cambridge University's Judge Business School.*

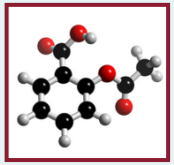
Health and life sciences

Medical devices

Auto-injectors
Inhalers
Endoscopy
Ultrasound
Wound healing
e-Health

Diagnostics

Telehealth
Blood glucose
Heart rate
Blood pressure
Biomarkers

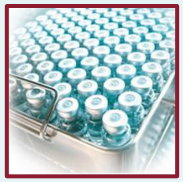


Active pharmaceutical ingredients

Biopharmaceuticals
Tissue targeting
Drug conjugation
New chemical entities

Pharmaceutical formulations

Excipients
Carriers
Liposomes
Propellants
Nanoparticles
Capsules



Manufacturing processes

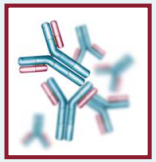
Spray drying
Freeze drying
Jet milling
Filling
Packaging

Generics

Bio-similars
Re-formulation
Patents expiries

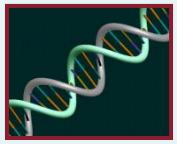
OTC drugs

Analgesics
Anti-microbial
Anti- fungal



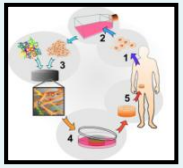
Vaccines

Dendritic cell
Recombinant vector T-cell receptor peptide vaccines
DNA vaccination



Gene therapy

Silencing
Tissue targeting

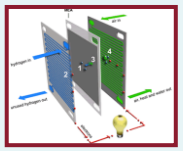


Regenerative medicine

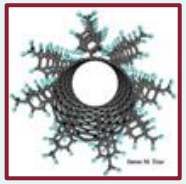
Cell therapy
iPSC
Tissue engineering
Cell-based vaccines

Clean tech and energy

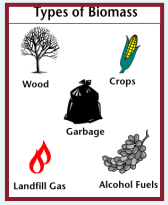
Wind energy systems



Fuel cells

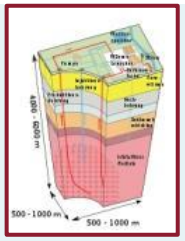


Nano devices & materials



Biomass

Advanced refrigeration



Geothermal energy Systems

Photovoltaic & component technologies

Clean coal carbon capture CO2-EOR

Refineries, power gen, co-gen.

Concentrated solar & other energy storage systems

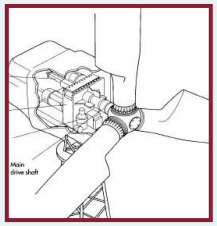
Marine transport

Desalination and water sanitation

Smart grid

Telecommunications and electronics

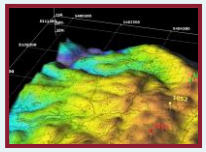
Wireless authentication
Physical/Remote access control
Merchant/Purchasing
Digital credentials



Clean tech
Smart grid
Smart meters
Transport management
Distributed sensor systems
Energy harvesting

Internet & data handling
Search
Cloud computing
Data fusion
Database replication

Mobile devices/applications
E-reader
Mobile search
Application software
Media convergence
3G/4G/WiFi



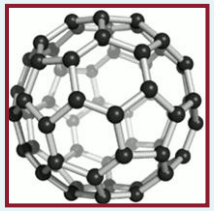
Geographical systems
GIS measurements
Satellite navigation/GPS

Telecoms standards
ETSI
Continua alliance
RFID
Blue tooth
Near field communication
Radio frequency identification

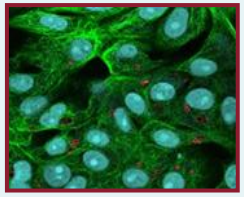
Hardware
Card readers
Routers
Mems
Flexible displays
Contactless card
Satellite communications

e-Health
Remote diagnostics
Device access control

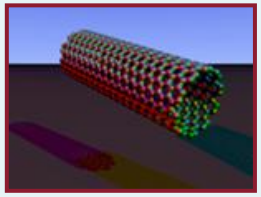
Nanotechnology



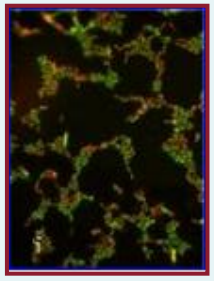
Nanomaterials
CNT
Graphene
Nanoparticles



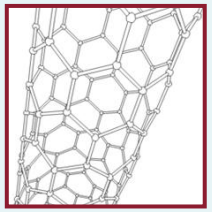
Nanobiotechnology
Bio-compatible nanoparticles
DNA nanotechnology
Nanospheres
Nanoformulations



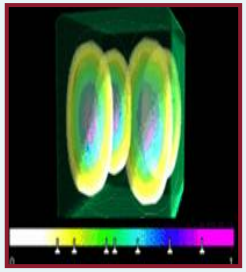
Carbon nanotubes
CNT, SWNT, DWNT, MWNT
Functionalization
Production
Purification



Nanotoxicity
Nanotubes
Nanospheres
Nanoparticles
Risk assessment technologies

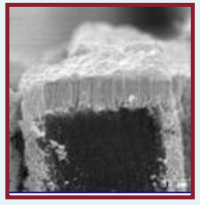


Tissue engineering
Nano-materials
Nano-fibers
Scaffolds



Nanoparticles
Colloidal gold
Iron nanoparticles
Nanostructures
Platinum nanoparticles
Quantum dots
Silver nanoparticles

Industrial fields
Advanced materials
Automotive, Aerospace
Electronics
Paints & Coatings



Environmental applications
Construction materials
Energy storage, generation and transmission
Water purification

Work sample - CambridgeIP report for UK IP Office: Part of the UK government's 'Hargreaves Review of IP and Growth'

CambridgeIP has recently completed a report for the UK IP Office considering innovation, market dynamics and policy options in selected 'cross-over' technologies.

CambridgeIP developed a unique collection of 15,000+ patents and related analyses focused on the telehealth sector. Our patent-based analysis was complemented by a literature review and interviews with industry experts.

- ✓Inhalers
- ✓Auto-injectors
- ✓Heart rate monitors
- ✓Blood pressure monitors
- ✓Blood glucose monitors

Our study focused on a) the effects of **patent thickets** on innovation and market dynamics; and b) the role of **technology standards** and **patent pools** as a possible response patent thicket emergence.

We identified drivers behind the emergence of patent thickets, techniques for the measurement of patent thickets, the impact of corporate IP strategies and gave policy recommendations. Our additional case studies in the Stem Cells and Nanotechnology areas highlighted problems posed by '**blocking patents**' in certain early stage technology spaces.

Full report available for download at www.cambridgeip.com

Outline: Climate change - Innovations & partnership models

- CambridgeIP snapshot
- CambridgeIP experience
- CambridgeIP team
- Contacts

Selected team members

Quentin Tannock
Chairman & Co-founder

Ilian Iliev
CEO & Co-founder

Robert Brady
Non.Exec Director

Mark Meyer
Business Development
North America

Ralph Poole
Boston Representative

Vladimir Yossifov
Geneva Representative

Arthur Lallement
Senior Associate

Helena v.d. Merwe
Senior Associate

Sarah Helm
Senior Associate

Yanjun Zhao
Associate

Key team members 1

Quentin Tannock (Chairman & co-founder)

International IP policy, IP strategy and law expert. Co-founded and has lead CambridgeIP from its outset.

Prior experience:

- Founder of a successful company in the chemical sector
- Law lecturer; facilitated major R&D collaborations at Cambridge University; Assisting Cambridge University Institute of Biotechnology start-ups with commercial and fundraising strategies
- Chairman of the Chartered Institute of Arbitrators IP & Electronic Media Group
- Member of Lambert Working Group on Intellectual Property tasked by the government to draft model contracts for industry-university collaborations
- IP analysis & strategic advice to nanotechnology venture capitalists

Education: Law, (Roman-Dutch, Common law, International law in Cambridge UK & elsewhere)

Ilian Iliev (CEO & Co-founder)

International IP policy, IP strategist and economist. Co-founded and has lead CambridgeIP from its outset.

Prior experience:

- Strategy and innovation advisory work for blue chip companies (including a Top 5 global corporate law firm), and technology companies and start-ups
- Co-founder of an award-winning biotech start-up in Cambridge; policy advice
- Founded and ran a 100+ employee business in the electrical industry in Southern Africa (1990s)

Education: Economics and Management; Completing a PhD on 'Innovation Finance' at the Judge Business School, Cambridge University

Dr Robert Brady (non-Exec. Director)

Successful entrepreneur and investor in the services sector. Has advised CambridgeIP for over 4 years.

Prior experience:

- Founder of Brady plc, a leading supplier of transaction and risk management software solutions to companies and banks operating in the metals and minerals, energy and 'soft' commodity sectors
- An active mentor and advisor for several growth companies, specialising in information technology and services. He is the current treasurer of Cambridge Angels investment group

Education: Fellow at Trinity College, Cambridge, where he specialised in the field of physics

Key team members 2

Mark Meyer (Houston Representative and Head of North America)

Mark leads our North America business development,and is based in Texas

Experience

- More than 20 years of oil and gas experience and 25 years of business development experience
- VP and Director level assignments at independent oil and gas companies, international oil companies, energy sector startups and high tech firms
- Recognised by the Harvard Business Review, Gartner Group and IBM Corporation for best practices in business transformation and business development

Education: BS in Chemical Engineering from The University of Texas at Austin.

Ralph Poole (Boston Representative)

Assists CambridgeIP in knowledge management and taxonomy methodology development and supports our clients based out of Boston

Experience

- Former Chief Knowledge Officer at Ernst &Young LLP and Cap Gemini; former partner at Boston Consulting Group and Bain & Company;

Vladimir Yossifov (Geneva Representative)

Assists CambridgeIP with relationships with patent authorities and the Swiss market

Experience

- More than 35 years of executive experience in intellectual property, transfer of technology, licensing, innovation and IP infrastructure development.
- Former director at the World Intellectual Property Organization (WIPO) for regional IP information and innovation promotion systems in Africa, Asia, Eastern Europe, Central Asia and the Caribbean.

…and finally…

Feel free to discuss your specific requirements with us

Visit CambridgeIP's www.boliven.com for free patent searches

Thank you !

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