New frontiers in the strategic use of patent information

Dr. Victor Zhitomirsky
PatAnalyse Ltd

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PatAnalyse is in the business of delivering IP intelligence to its clients.

We take responsibility for finding the patent information required by our clients and then structure and make sense of it

To deliver a project we use a proprietary, comprehensive search management system to capture expert judgements and combine these with artificial intelligence analysis to produce a pre-analysed universe of data tailored exactly to each client's needs

Our experience in technology consultancy allows us to provide an interpretation of the 'competitive intelligence landscape'; our analysis is closely aligned to the client's business strategy

Our client, as the user, first influences how the universe of patent data is gathered and structured and then can exploit it using the on-line patent management system provided by PatAnalyse

Our core strength

We transform the patent search process from 'black magic' into a logical and fully traceable self-learning iteration process

We provide consultancy services underpinned by patent searches of unprecedented accuracy and completeness using our unique search management tools

Our 'expert judgment' approach is integrated with artificial intelligence algorithms and is fully controlled by subject area experts

It is not unusual for us to find up to four times more patents in clients' areas of interest compared to the results provided by our competitors

Our clients are usually shocked when they learn the limitations of the conventional patent search strategies used by their advisors or internal teams

PatAnalyse has developed innovative methods using modern 'Software as a Service' technologies

Our algorithms are unique in providing capabilities beyond iterative assistance with finding and using all relevant patent codes and keywords – albeit critically important. The methodology is based on a pattern recognition algorithm and can find an additional 30% of patents which are misclassified in the European or US patent offices. These extra patents might well contain the documents that prove critical to the patent strategies of our clients

Special emphasis is also given to:

- correcting and enhancing raw bibliographic records

- efficiency of task distribution

- organising collaboration between experts

- assisting our clients with mining patent data in the post-project phase

What is PatAnalyse?

Integrated technology consultancy specialising in high quality patent searching and strategic analysis

The PatAnalyse core team has been working together for over a decade in the technology consultancy cluster in Cambridge, UK

Over the years the team has delivered a wide variety of patent landscape assignments for Blue Chip health care, medical devices, telecom, industrial, white goods, domestic and consumer goods companies

Our clients have access to an unparalleled skill set: our teams of diverse subject experts and seasoned business consultants work together to provide collective 'IP Intelligence'

Consulting services

"Many of the answers to key questions of technology and business strategy can be found in the patent databases if you know how to find them.

PatAnalyse has the powerful tools and expertise to do this and to present the answers using clear, easy to communicate, views of patent landscapes"

Alan MacDougall, European Patent Attorney
partner at Mathys & Squire

Summary

Premium services which are critically dependent on the completeness of the patent searching results

'Patent landscape' studies of international R&D trends, used for:

- competitor intelligence
- technology scouting
- white space analysis
- licensing-in (e.g. through open innovation)
- technology forecasting, technology road mapping

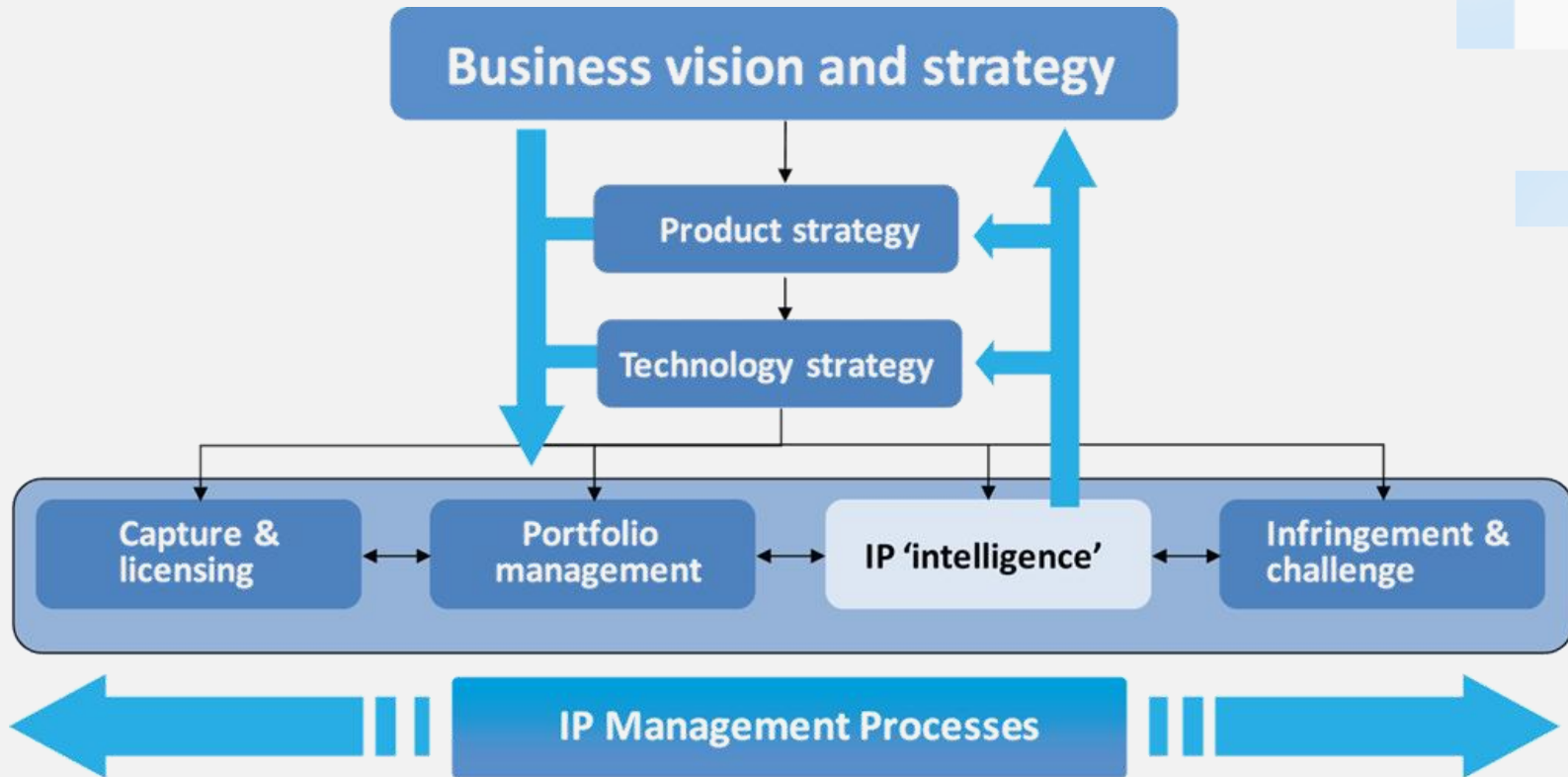**Due-diligence studies before in-licensing or acquisition**

Strategic portfolio alignment

Freedom to operate (FTO) analysis

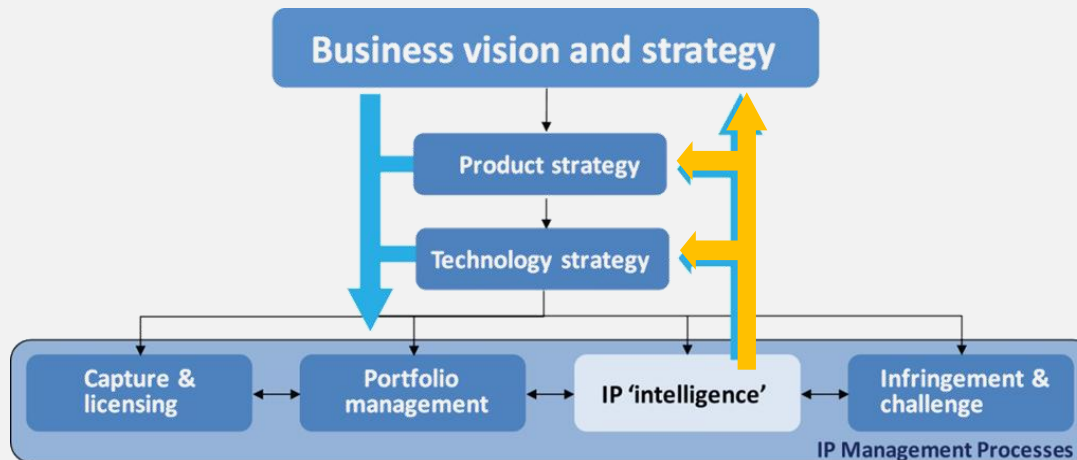**Litigation support to reveal the key evidence for the validity challenge**

Our analysis is provided in combination with the understanding of the business issues facing the client organisation

Our flagship offering helps to close the feedback loop between Business Strategy and IP Management

- detailed analysis of each top company and each technology cluster
- identified novel solutions, white spaces and potential partners
- systematic approach to Open Innovation technology scouting
  - there is a chance that competitors are doing it already!

Our findings contribute to technology forecasting and management

Patent mapping benefits

A Patent Mapping study is a 'deep dive' into the Invisible web - to the information derived from patent databases

- What technologies are already deployed and what is emerging?
- What are the benefits that these emerging technologies bring?
  - Their ownership position
- Whether there is any apparent 'white space' in the IP landscape?
- How serious are IP threats?
- What opportunities there are to in-license patents from third parties?

Benchmark the clients' existing patent portfolio against competitors

Inform the strategic decision makers in the client organisation

Align research budgets according to the gained intelligence

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Advanced Energy Storage Technologies: Case study

The de-duplication algorithm aggregated about 12,000 simple patent families from about 40,000 national patents

The iterative search was build up using a combination of

- 110 assignees
- 1,200 inventors
- 2,600 patent codes (including IPC, ECLA, ICO, US, and Derwent)
- 1,250 keywords

All forward and backward citations were added to the portfolio

Only 3% of patent families were left unassigned

- in the raw patent records more than 40% of US patents were left unassigned
- the latest assignee information was taken from INPADOC legal file; this information is available for 90% of US patents

Advanced Energy Storage Technologies: Statistics

Our tools enable us to find up to 50% more patents in comparison to the most experienced patent searchers

Search statistics	
IPC, international system	**31%**
ECLA, European system	**16%**
US classification system	**14%**
IPC + ECLA	**42%**
IPC + ECLA + US	**48%**
Keywords	**53%**
IPC + Keywords	**64%**
IPC + ECLA + US + Keywords	**69%**
using PatAnalyse artificial intelligence	**99% to 100%**

Search channels — *useful patents found, %*

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Advanced Energy Storage Technologies: Statistics

The top 90% of the patent portfolio is identified at the very beginning of the screening process

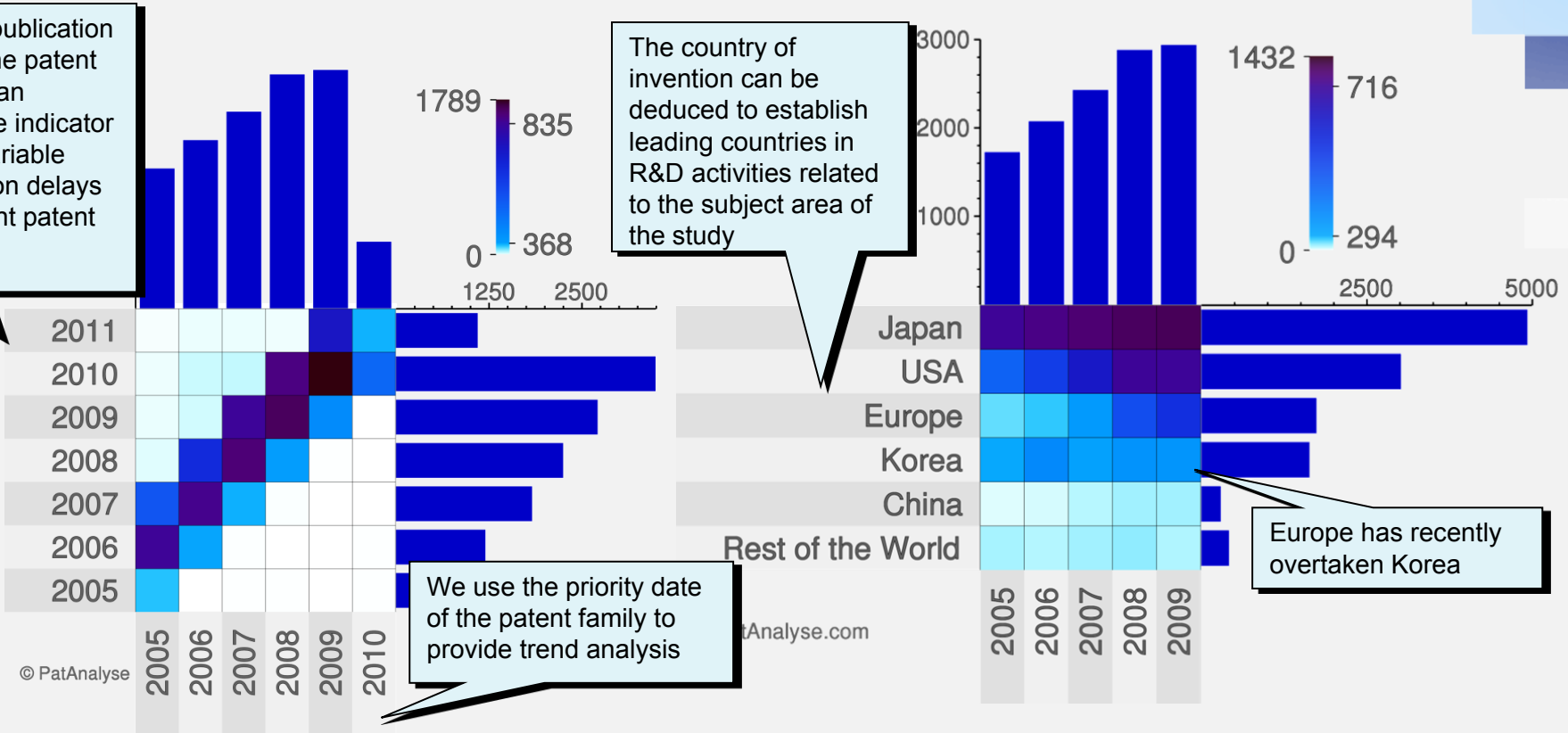| Relevance score statistics								
Automatic relevance score	**Distribution of useful patents, abs**		**Distribution of useful patents, %**		**Distribution of wrong patents, abs**		**Separating out useful patents, %**	
1	7494		62%		314		96%	
0.75..0.99	1366		11%		227		86%	
0.50..0.75	1199		10%		508		70%	
0.25..0.50	981		8%		1036		49%	
0.10..0.25	444		3.7%		1284		26%	
0.05..0.10	270		2.3%		1659		14%	
0.001..0.05	122		1%		1876		6%	
0	61		0.5%		1603		3.7%	
-0.25..-0	89		0.7%		10532		0.8%	

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The on-line patent maps are interactive: clicking on the area of the patent map takes a user to the details of the patents.

Earliest publication date of the patent family is an unreliable indicator due to variable publication delays in different patent offices

The country of invention can be deduced to establish leading countries in R&D activities related to the subject area of the study

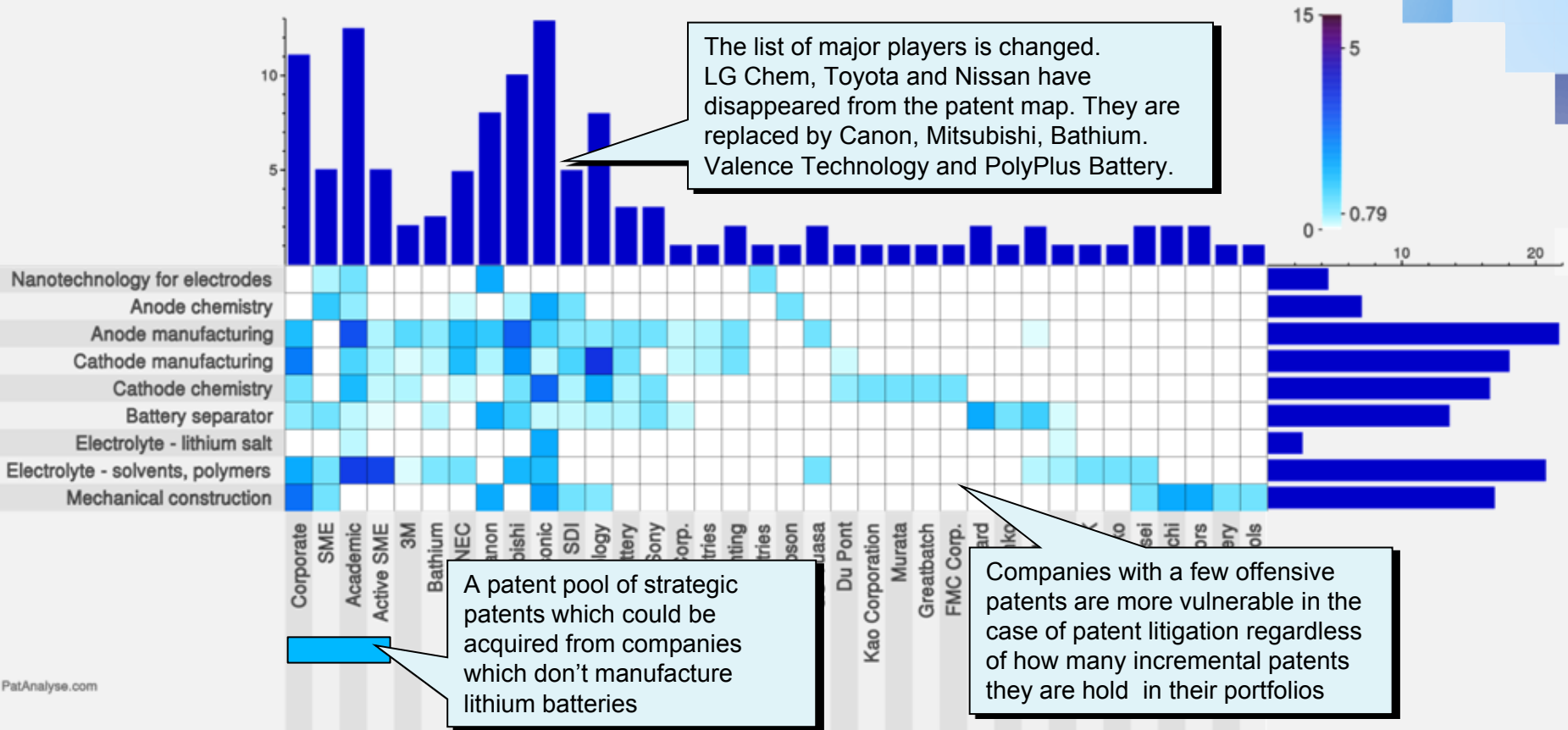We use the priority date of the patent family to provide trend analysis

Europe has recently overtaken Korea

© PatAnalyse

Top Assignees vs. technical categories for generic Lithium batteries, patents with priorities from 2005

Assignment to technology category is done by subject experts; each technology category in the source data appears on one row of the Intensity map.

This legend shows the non-linear colour scale used to convert the numbers in each cell to a specific colour

Darker colours indicate higher levels of activity

Unassigned patents form a small fraction of the patent portfolio

Unified assignee information for each patent family appears on each column

A bar chart shows the total number of documents in the row or column. In this case, the bar chart shows the total number of documents in each technical category

Most offensive granted patents with priorities from 1993 to 2000

The list of major players is changed. LG Chem, Toyota and Nissan have disappeared from the patent map. They are replaced by Canon, Mitsubishi, Bathium. Valence Technology and PolyPlus Battery.

A patent pool of strategic patents which could be acquired from companies which don't manufacture lithium batteries

Companies with a few offensive patents are more vulnerable in the case of patent litigation regardless of how many incremental patents they are hold in their portfolios
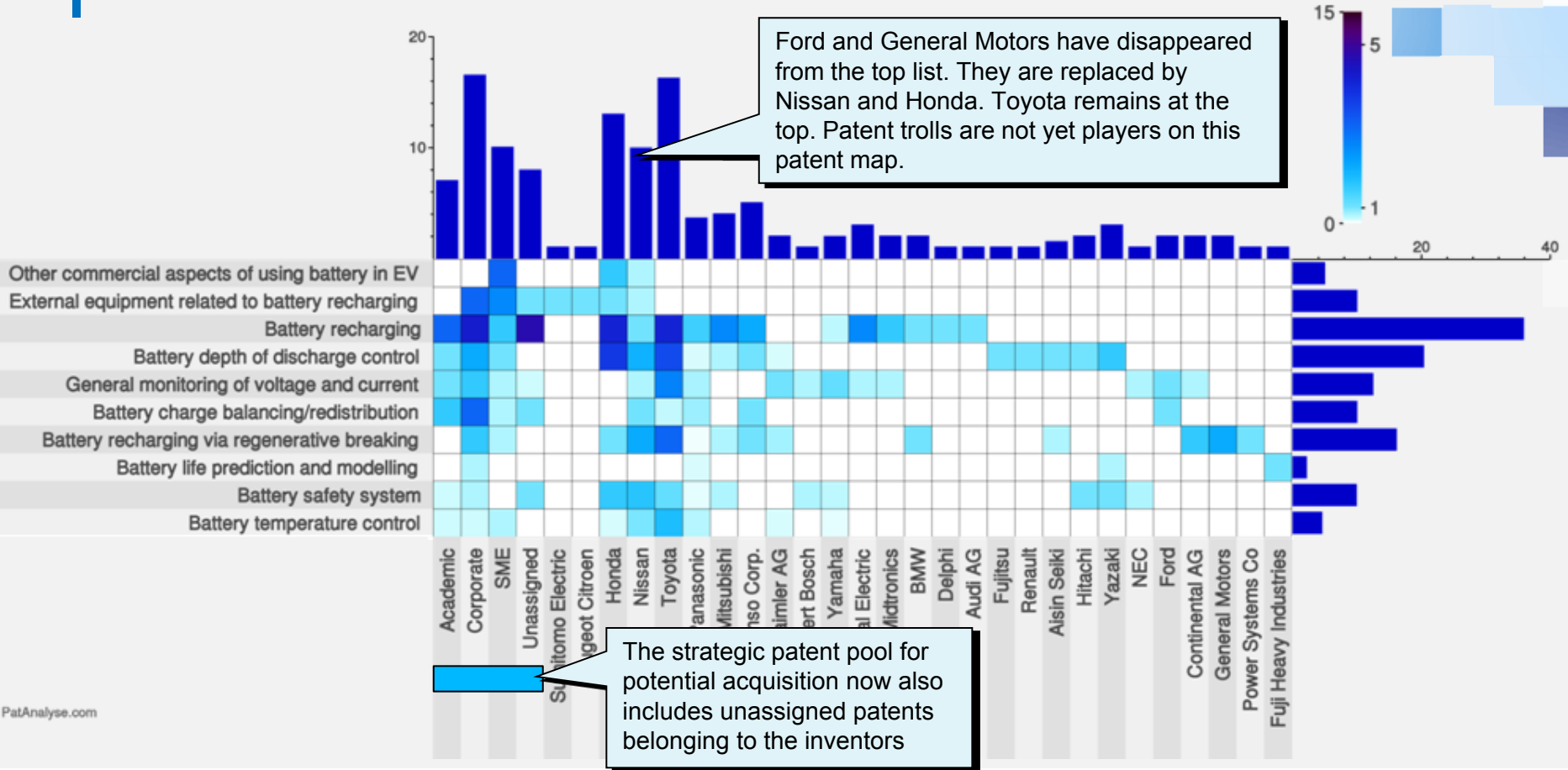
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Top Assignees for battery management systems for electric vehicles, patents with priorities from 2005

A large fraction of unassigned patents ; mainly related to software algorithms

This is a patent map of R&D activities of the end-users of traction lithium-ion batteries

Patent trolls are already present on the patent map

© PatAnalyse.com

Most offensive granted patents with priorities from 1993 to 2000

Ford and General Motors have disappeared from the top list. They are replaced by Nissan and Honda. Toyota remains at the top. Patent trolls are not yet players on this patent map.

The strategic patent pool for potential acquisition now also includes unassigned patents belonging to the inventors

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Top Assignees vs. technical categories specific to the chemistry of anodes of Lithium battery

Nanotechnology is still an academic subject, but major players are catching up

This bar chart is an expansion of the third row on the main patent map, page 15

Titanium oxide material system R&D is heavily dominated by Toshiba

Academic activities

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Time line for technical categories specific to anodes of Lithium battery

Titanium oxide and nanotechnology are among the most recent R&D trends

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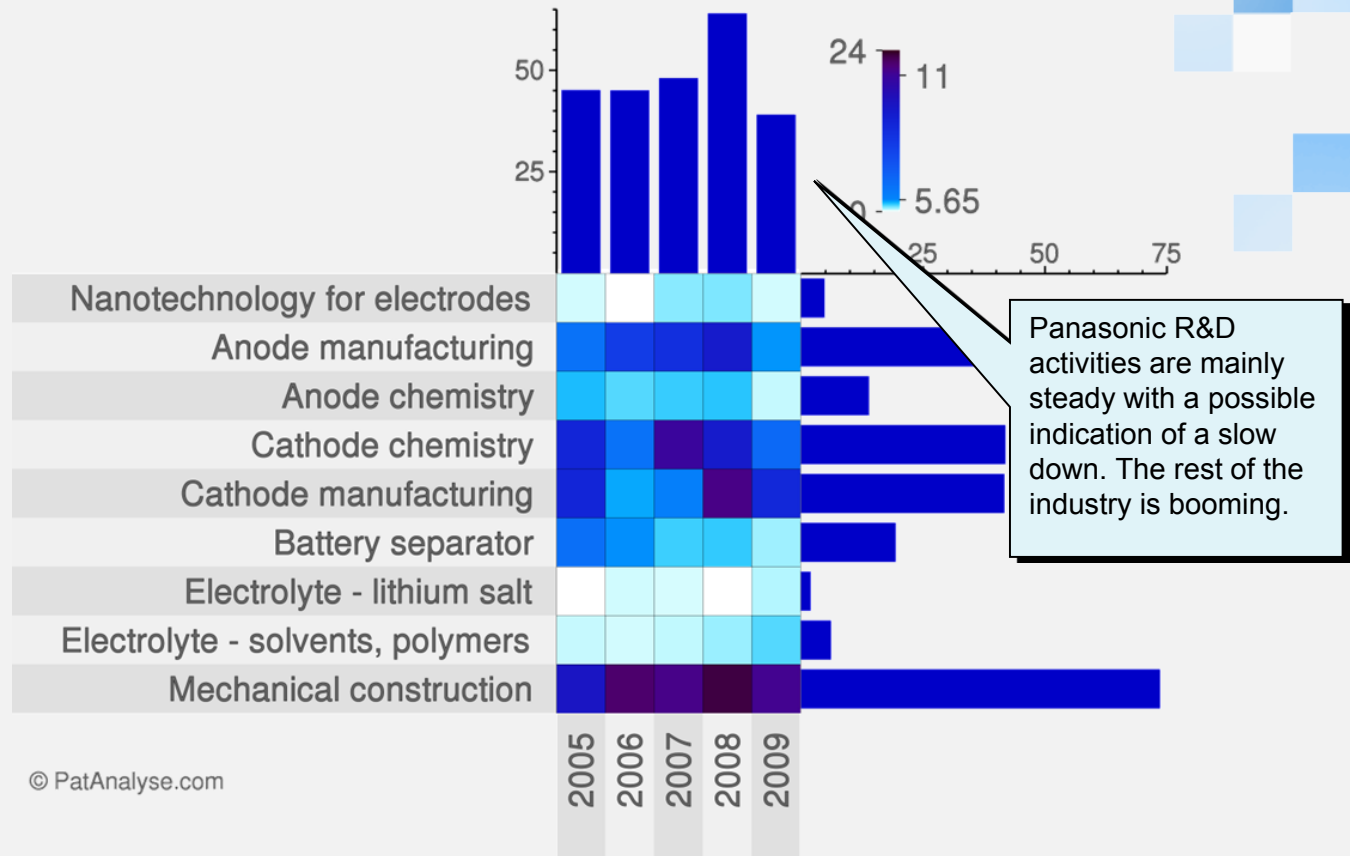## Top Assignees vs. technical categories specific to the chemistry of cathodes of Lithium battery

Panasonic dominance is fully developed

This bar chart is an expansion of the fourth row on the main patent map, page 15

Academic activities

Lithium sulphur proponents
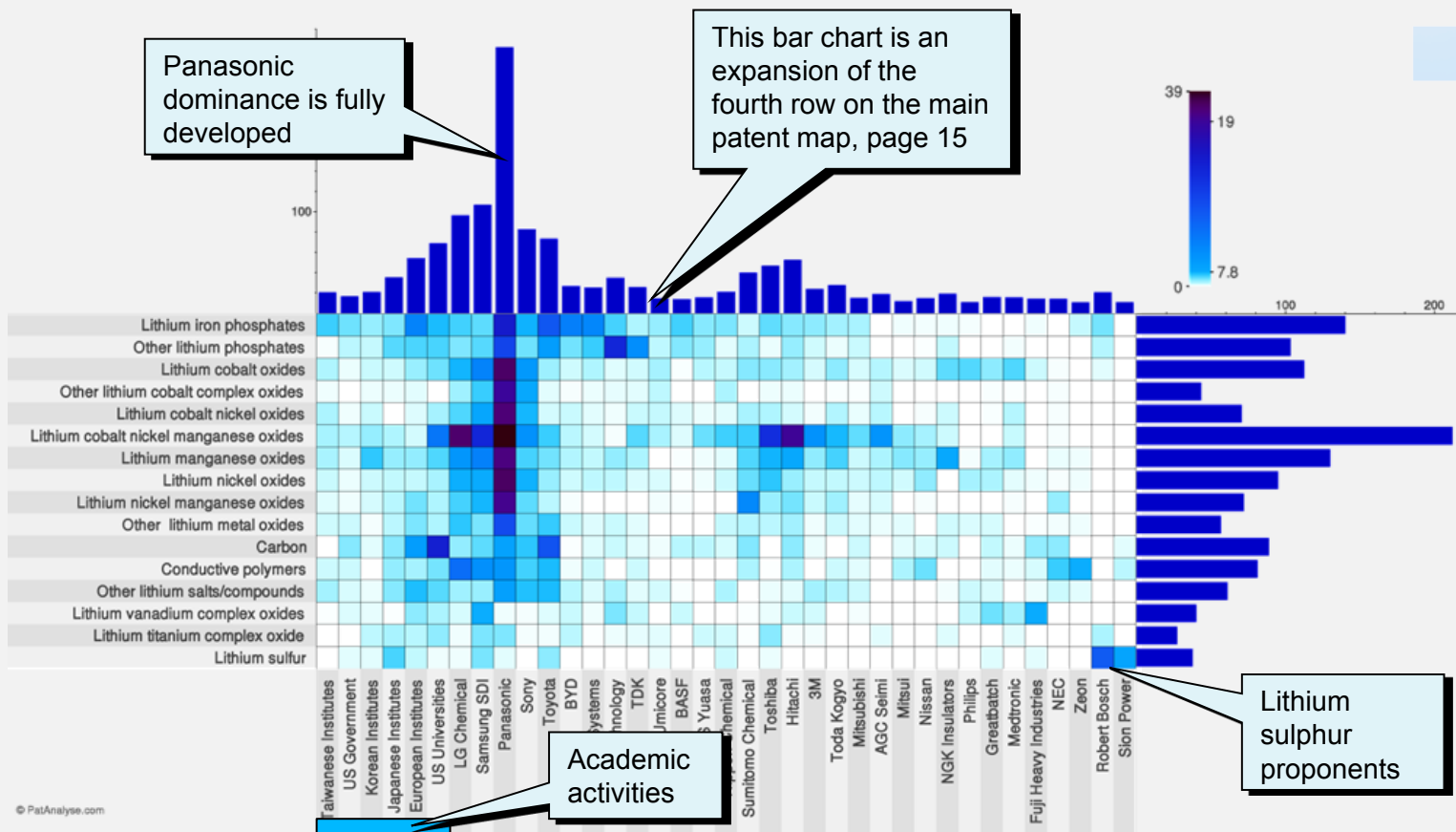
Time line for technical categories specific to cathodes of Lithium battery
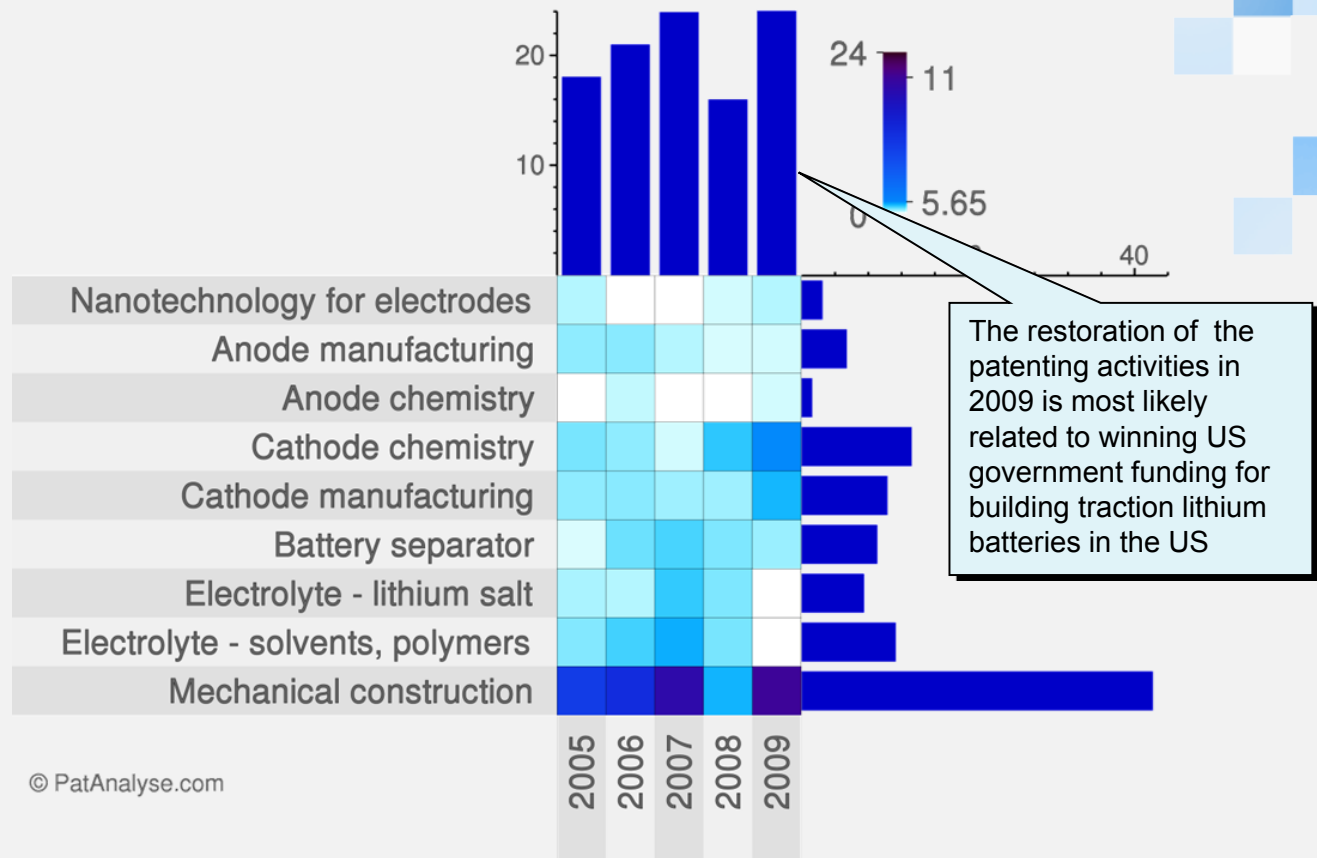

Lithium phosphate material systems and conductive carbon additives are among the most recent R&D trends; They help to increase the speed of the battery recharging process
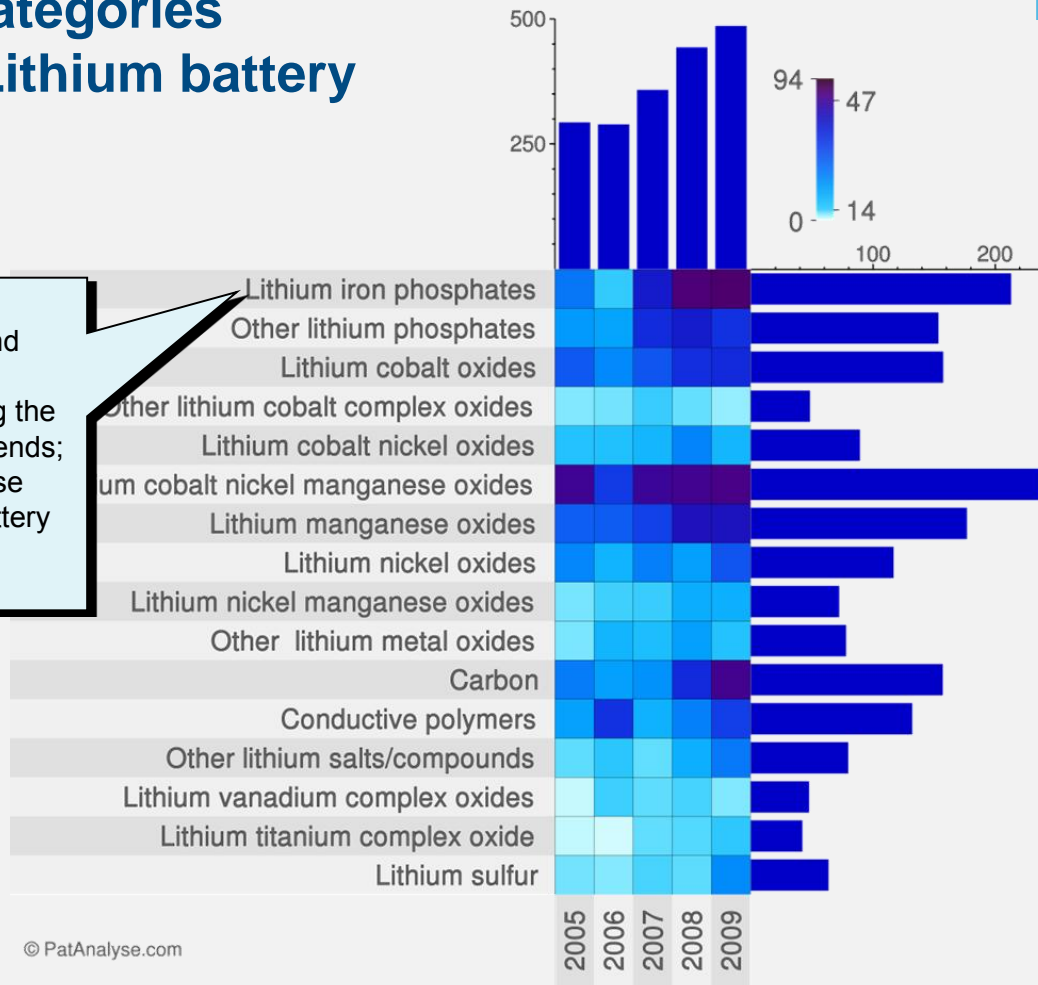
© PatAnalyse.com

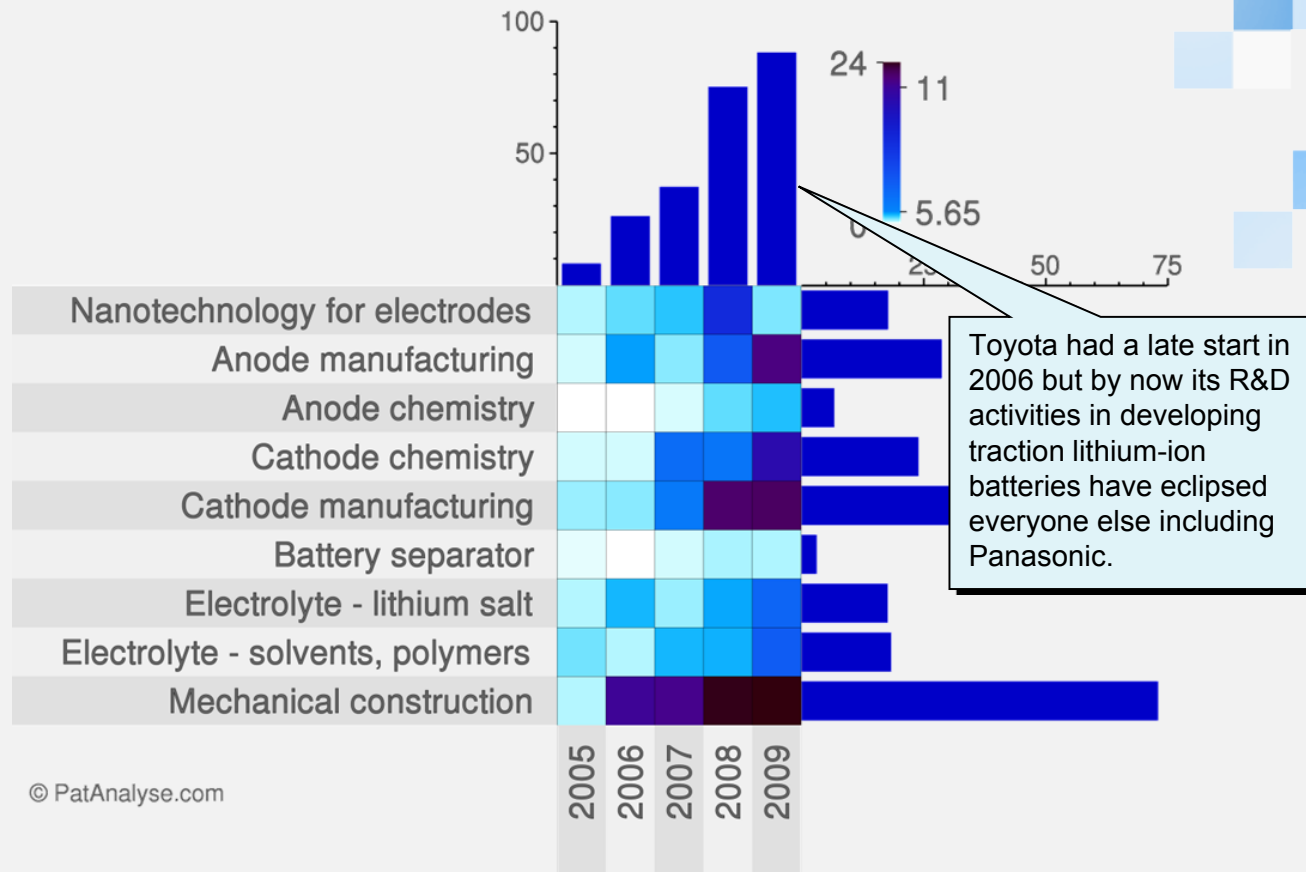## Benchmark of Top Assignees in Lithium Traction batteries: Panasonic

Panasonic R&D activities are mainly steady with a possible indication of a slow down. The rest of the industry is booming.

© PatAnalyse.com

Benchmark of Top Assignees in Lithium Traction batteries: LG Electronics

The restoration of the patenting activities in 2009 is most likely related to winning US government funding for building traction lithium batteries in the US

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Benchmark of Top Assignees in Lithium Traction batteries: Toyota

Toyota had a late start in 2006 but by now its R&D activities in developing traction lithium-ion batteries have eclipsed everyone else including Panasonic.

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BIOMEDICAL PATENT MAPPING

Biomedical patent portfolio
340,000 patent families

UK patent portfolio
16,000 (4.7%)

Top 50
GLOBAL COMPANIES
94,000 (28%)

Top 50
UK COMPANIES
9,000 (2.6%)
57% of UK
PORTFOLIO

Top 50
NON-COMMERCIAL
ORGANISATION
18,000 (5%)

Top 150
SECOND TIER PLAYERS
46,000 (13.5%)

TIMELINE

UK TIMELINE

BY COUNTRY

PATENT MAPPING
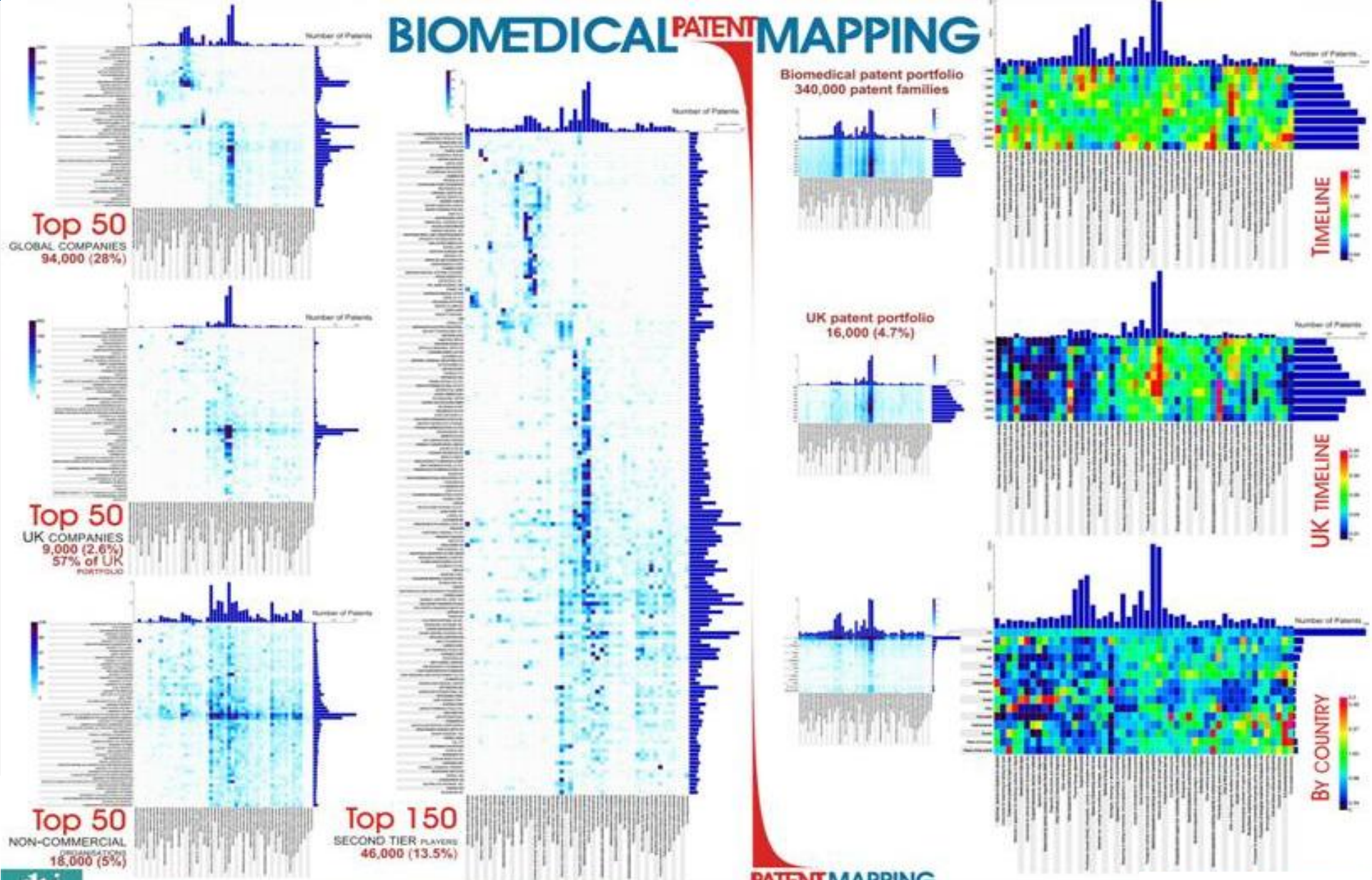
Benefits of using our services

"PatAnalyse offers a really intelligent way to cope with the huge volume of patent information available worldwide"

Dr Bakuri Lanchava
European Patent Attorney
OSRAM GmbH

The PatAnalyse innovative toolset

Efficient web-based collaboration between technical experts under the control of artificial intelligence

Patent pending software tools developed by PatAnalyse have captured and automated our unique best practise in

- self-learning iterative patent searching

- patent screening integrated with an error correction algorithm

- patent classification

- bibliographic data cleaning

- visualisation of Patent Landscapes

Benefits of using our service

The best possible quality of deliverables is combined with quick turnaround

It takes about ten weeks to complete a medium-size patent landscape study

- confidence in the completeness of results from the patent search

- improved quality of data through 'clean' patent bibliographic records

- analysis of information by business consultants with a good grasp of technology issues

The information contained in patents can stimulate fresh ideas and accelerate the innovation process

The on-line patent management system provided by PatAnalyse can be used to guide the customer team to key individual patents

Clients might need to look at competitors' patents to check the strength of their own IP in order to avoid unnecessary legal and R&D costs

But these patents also provide a comprehensive source of technical analysis – which frequently highlight the shortcomings of the available solutions

Putting together a proper understanding of un-met needs with insights into tried and failed technical solutions can often stimulate disruptive innovation – solutions which transcend existing IP landscapes and venture into 'white space'
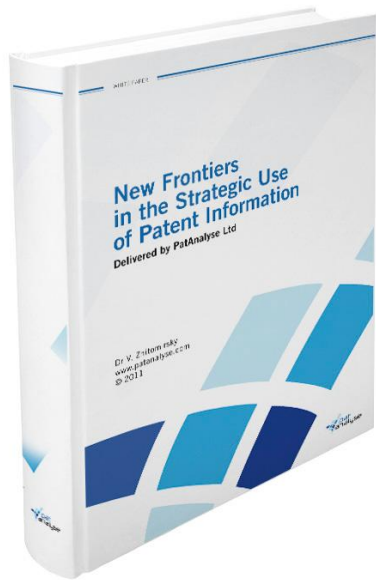
Further details of our services and our approach, are presented in the white paper document which can be downloaded at

http://patanalyse.com/whitepaper
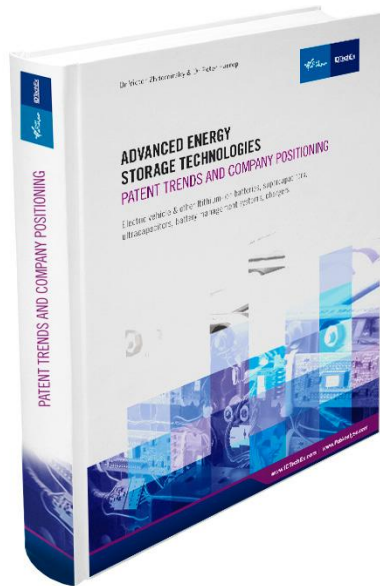
Further examples from our Patent Landscape Study "Advanced Energy Storage: Patent Trends and Company Positioning" can be accessed at

http://patanalyse.com/AES_report

Contact Us

As a technology consultancy with highly comprehensive proprietary software tools, PatAnalyse is uniquely positioned to help clients with Competitive Intelligence studies

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