Analysis Report: Fighting Rising Temperature

Last update: August 2018

Background

The current trend in global temperature is set to warm by 2 degrees centigrade by the end of this century. The hottest 10 years on record have all been within the past 15 years, and with denser populations and energy networks, cities suffer worst from the increase due to the heat island effect: The air temperature of a city with 1 million inhabitants can be between 1-3 degrees centigrade warmer than its surroundings.

Methods in Motion

Cities around the world have been trialling different methods to tackle the rapidly rising temperatures. In Guiyang, China, city planners studied wind patterns, water bodies and nearby green belts to incorporate “wind corridors” to blow throughout the city, reducing ambient temperatures with no additional cost or maintenance.

As well as working with what is already there, many cities are committing to increasing the amount of green space within their boundaries. In Australia, where “extreme temperatures” is a less relative term than elsewhere in the world, many cities are committing to increasing their tree canopy cover, with Sydney aiming to expand coverage by 50% by 2030. New trees would provide shade to residents and help cool the immediate area via evapotranspiration of water from the leaf surface. An increase in trees also helps to improve air quality and reduce carbon emissions in the local area.

There are many methods used to reduce city temperatures, and in terms of IP there are 2 core technologies included in the US Environmental Protection Agency’s 5 main strategies for dealing with the heat island effect: Cool roofs and cool pavements, both achieved using heat and radiation reflecting coatings.

Traditional black asphalt absorbs much of the sun’s energy that hits it, holding in heat and in some countries becoming too unstable to drive upon in unusually hot weather. Los Angeles, among other cities, is investigating a white coating that can be applied to road surfaces as well as roofs and walkways. Originally designed to hide spy planes from satellite infra-red (IF) camera technologies, the coating has been repurposed, the heat and IF reflective properties being utilised for themselves and not for a secondary purpose such as detection avoidance. The coating reflects the majority of the sun’s energy and can keep an area up to 5.5 degrees centigrade cooler. They form part of a scheme to make Los Angeles 1.67 degrees centigrade cooler over the next 20 years.

Technology Breakdown

Starting with a keyword search to look for reflective coatings, class codes for the technology area were identified along with additional keywords used to refine the search criteria. Included amongst these results are patents for reflective glass-granule substrates to reflect light, weather resistant coatings designed for use within solar panelling and stealth paint designed to hide spy-craft from infra-red sensors, an excellent example of a patent describing a technology to solve one problem that can be repurposed as a solution for an entirely different scenario. An excellent example of these coatings is the Chinese patent application: CN20181172242 applied for in March this year.

Figure 1: PatBase Analytics V2 Dashboard view for the technology area

Geographic Breakdown

To date, the key jurisdictions are the USA, WIPO, EPO, Germany and China.

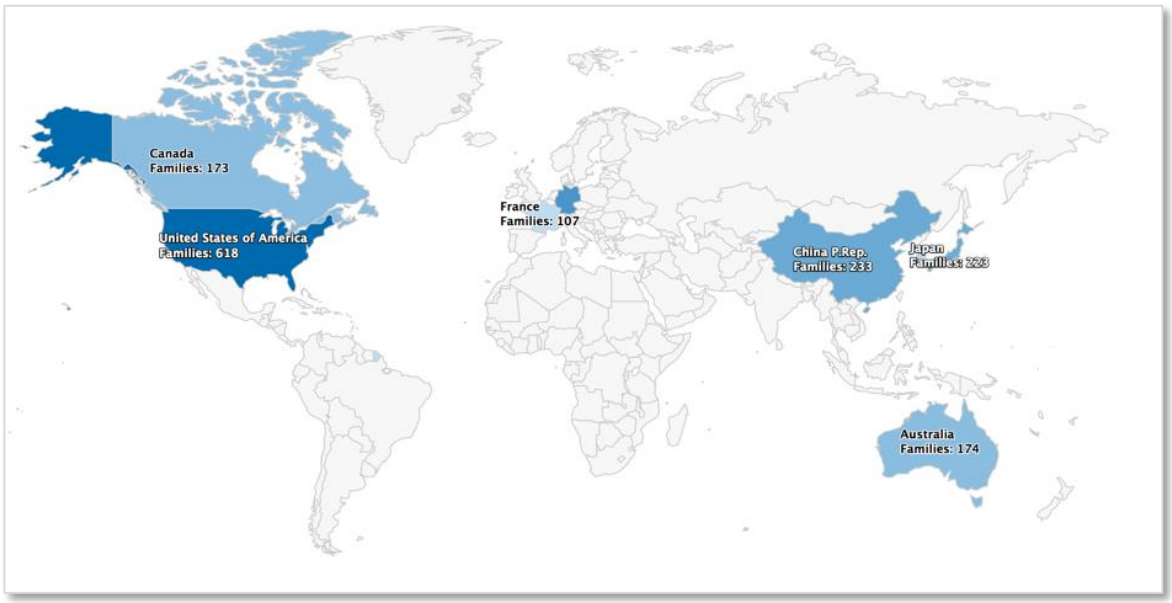

Figure 2: Top 10 jurisdictions by number of families

Two of the major players in the technology field are US companies (Certainteed Corp and 3M), so it's not surprising to see the US in top position with 659 families compared to China's 607. Certainteed possess more than twice the patent families in this area as their nearest rival 3M. It is worth noting however that while Certainteed possesses more families than its competitor, 3M as a multinational is protecting their IP across more of the major jurisdictions, being the only assignee to appear in 4 of the top 5 patenting entities across all 5 primary issuing authorities for this technology.

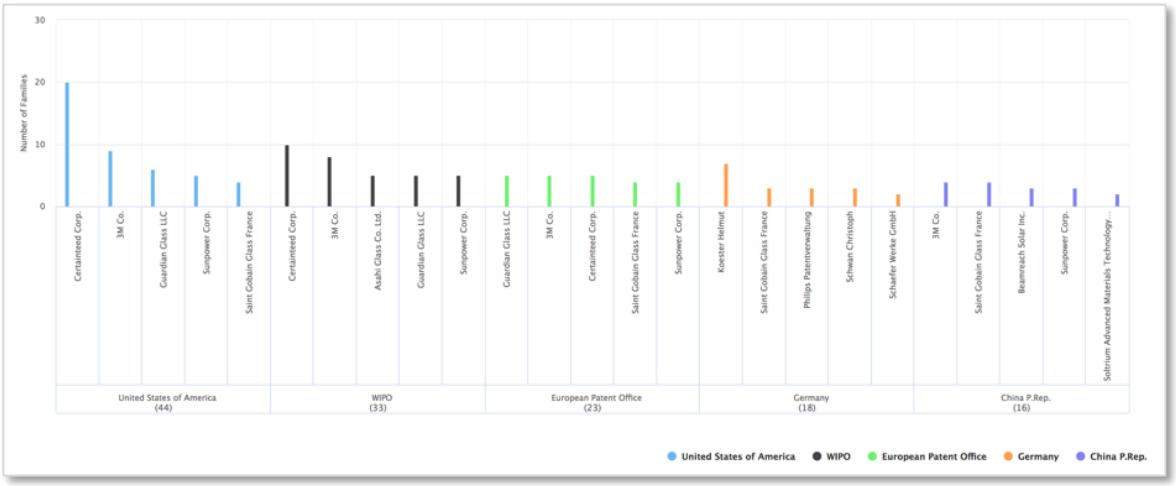

Figure 3: Top 5 assignees by jurisdiction (by number of families)

Nations like China and the US are key players in this market. 2018's summer notwithstanding, their ambient temperatures have always been on the high side globally, and it is they that will trail-blaze the methods and technologies required to keep city living possible as the heat rises. Germany's appearance amongst the top 5 may be in part due to the German government's continued subsidies for renewable energy technologies. Whilst installation peaked in 2012, the extension of the scheme into 2018 makes Germany a valuable market for solar vendors to operate in for the near future, and reflective coatings are an important component of many solar energy and heating products.