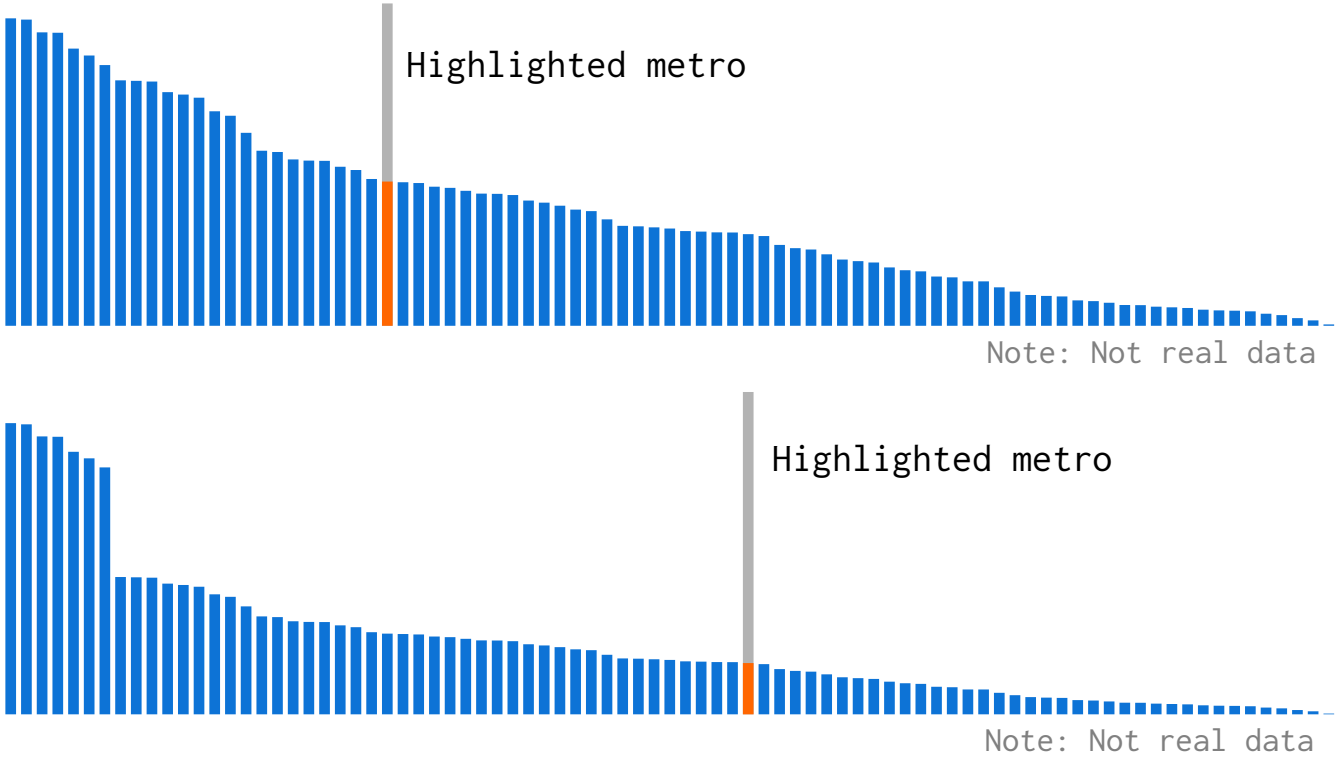


Overview

This document presents three concepts for enhanced graphics in the cleantech patent paper. These sketches are not meant to convey the final look and feel of the interactive(s), rather their purpose is to facilitate thinking around product goals. We can choose to do any/all of these or scrap them and move in a different direction. In terms of interactive structure, think of the items below as independent modules. We can place them anywhere in the final web page to facilitate the flow of the narrative, or we can place them all together in a dashboard-like view.

I. Convey a sense for the distributions of key indicators and highlight leading metro areas

Metrics: [a] patents/year, 2011-16, [b] patenting intensity, and [c] patenting by technology category



In the charts above, the user can hover over a bar to reveal a place name and the underlying value. Sometimes this type of interaction can be tedious, especially when there are 381 bars, so we can add a metro dropdown menu as a second way to highlight a metro area.

Note that the marginal cost of adding new bar charts like these to the final web page is low. So we could stamp one out lots of these and place them throughout the page. E.g. we could have one for the number of patents in Hydro/Marine power and we could build in a way for the charts to annotate, say, up to 5 metros. This could facilitate a more fluid narrative because you could write something like, "In the niche category of Hydro/Marine power, Houston, Los Angeles, and Boulder lead the way... ," and the chart would already have those places labeled. The user could of course interact with the chart, but they wouldn't need to in order to see the main point.

II. Provide a quick read out of place-specific metrics

I think we settled on providing values and ranks (out of 381) for: [a] patents per year (interchangeable with total patents), [b] patenting intensity, and maybe [c] share of U.S. patents.

In addition, we would provide lists of the top technology categories and patent owners. We have yet to decide on how these lists would be created but two options are to either pick an arbitrary number, say 3 or 5, or select based on thresholds, say, at least 5 patents and at least 10% of total patents. This is yet to be determined, but we should strive to provide highlights rather than exhaustive lists.

Metro select ▼

Patents per year

100

Rank: 10th

Patents per person

5

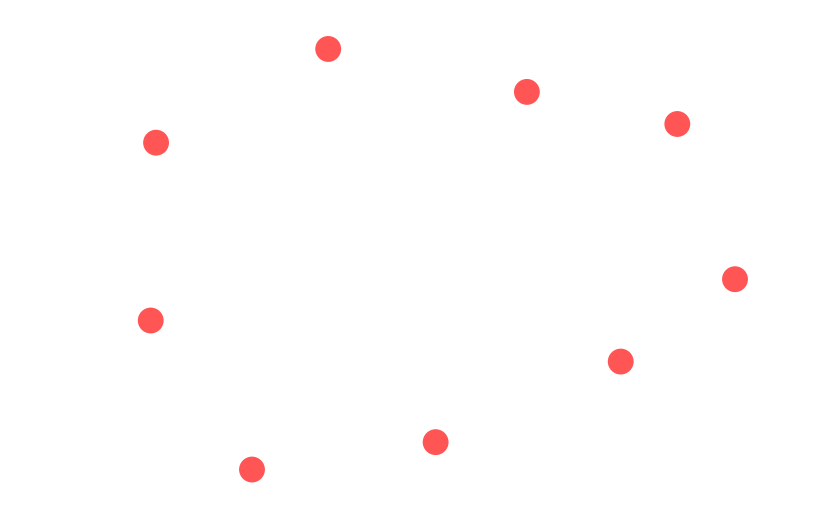
Rank: 10th

Top technologies

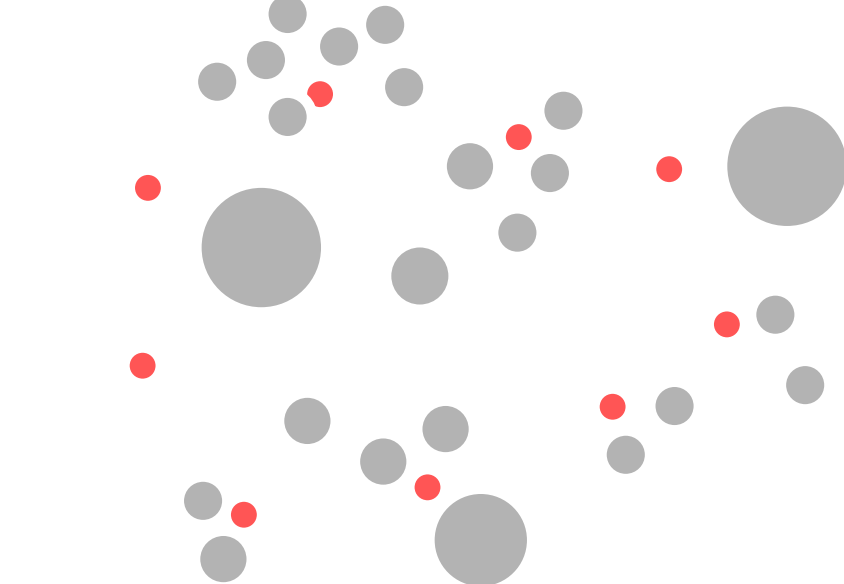
Major patent owners

III. Provide a comprehensive illustration of the metro universe according to patenting category

Imagine a diagram with 1 node per technology category:



Next, imagine that these nodes possess a kind of "gravity" and that metro areas are attracted to each node based on the share of its patents that come from the associated technology category. Furthermore, size the metro dots based on their number of patents:



These diagrams are often fun and engaging. Users can drag them around and they react according to the "gravitational forces" we assign. More importantly, they can be illustrative of a set of complex relationships without burdening the user with a bunch of methodological details like trying to explain a clustering algorithm. Here's are a couple examples to give you a general sense of how you can interact with them:

- > <https://bl.ocks.org/mbostock/1804919>
- > <https://bl.ocks.org/mbostock/4600693>

Alternatively, we could do something very similar to what we did for energy decoupling: small multiple graphics, sortable by share of patents from a each technology category. We'd need to determine the form of each small multiple (perhaps stacked bar) and we would have to limit the interface to, say, 25 small charts for each technology category. The energy decoupling graphic had 50 small multiples, one for each state, and I think that is about the maximum we should do.