Electrified railways a short history

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In the last post I had a quick look at the controversy over electrified railways in the north of England but the history of electrification is both interesting and meshes quite well with the ethos of this site. The first electric railway in the world was demonstrated at a Berlin fair in 1879. The first electric railway in the UK was pleasure railway in Brighton, England (1883). Its still working. Illustrating one of the many advantages of electrification, longevity. The same year a line in Austria was opened using overhead wires. From that point forward progress was slow. The first obvious targets for electrification were underground lines. In 1890 parts of the London Underground were electrified and parts of the Mersey rail system (which has long tunnels under the Mersey). By the 1930's very large numbers of countries had some electrified lines. There were several major problems to overcome and these are still present today. An existing technology (in those days steam was dominant and this was hard to replace. The Swedes did the maths and decided coal was very expensive in 1920. By the time they had electrified the ore line to Narvik in Norway the price had plunged. Nevertheless the advantages of electric traction (speed and reliability) outweighed this and they increased their electrification in the 1930's. However, steam was still dominant until the 60's, then in some countries like the UK diesel took over. Another issue at least in the UK and France until after the war was that the rail companies were private. This is now potentially an issue again (in the UK). This made it more difficult to come up with a common standard which as the Swedes found reduced costs. However most European countries had state owned railways in the 1930's which does not explain the slow uptake. Looking at the maps of electrification in the 1930's one thing stands out. There is a clear correlation between where the lines were electrified first and hydropower. This is particularly clear in the map shown below.

Intriguingly as you will see from the map there is almost no electrification in the alpine sections. This is because the route ownership was different. What is also surprising was that what we think of as pioneers of electric traction such as Norway (now 64% electrified) had low levels, probably due to the dominance of steam mentioned above. The same link between hydropower and electric railways was seen in Germany and Austria. Indeed the Austrians built power stations specially. Swiss federal railways were largely electrified. What is surprising that countries without hydropower had the same levels of electrification (Belgium, Denmark, Holland) as Norway. These four electrified suburban commuter lines first. Although the % of total lines was low the % of total traffic was much higher. There was one last advantage that countries that electrified lines found, that it increased traffic. This is especially true in the UK where Southern railways electrified lines that were quiet and built coal fired power stations to provide the electricity. In Belgium they started with the boat train lines to increase speed. The battle in the UK continues with about a third electrified (below European average) despite the many clear advantage outlined above. There is little doubt that we will need to increase this total greatly over the near future. Neil

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