

# Electrification of the Trønder and Meråker Railway Lines

An important transport boost for Trøndelag

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## Finally ready for electrification!

The electrification of the Trønder- and Meråker Railway Lines will happen in three stages in order to realise the benefits of the electrification as early as possible. These stages are:

- ▶ Trondheim – Stjørdal, including Stavne – the Leangen Line
- ▶ Stjørdal – Steinkjer
- ▶ Hell – Storlien

This will allow Jernbaneverket to start running electrical commuter trains from Trondheim to Stjørdal as soon as possible. The electrical trains will run on selected departures first, both to gain experience and to realise the benefits as early as possible.

In total, 200 km of railway will be electrified. Jernbaneverket will also establish two converter stations: one at Hell and the other at Steinkjer.

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## An important transport boost for Trøndelag

This is the first time since 1970 that an extended stretch of railway in Norway will be electrified. Certain overarching societal goals underpin the project, and they include increasing railway transport volumes, both in terms of passenger and freight traffic, as well as faster and better railway freight between Norway and Sweden. Limiting the negative climatic and environmental effects from railway traffic are also important objectives. Passenger traffic on the Trønder Line has grown significantly the last few years. From around 500,000 passengers in 1993, to almost twice that in 2010. Population growth projections for the Trondheim area indicate that there will be a higher demand for better train service.

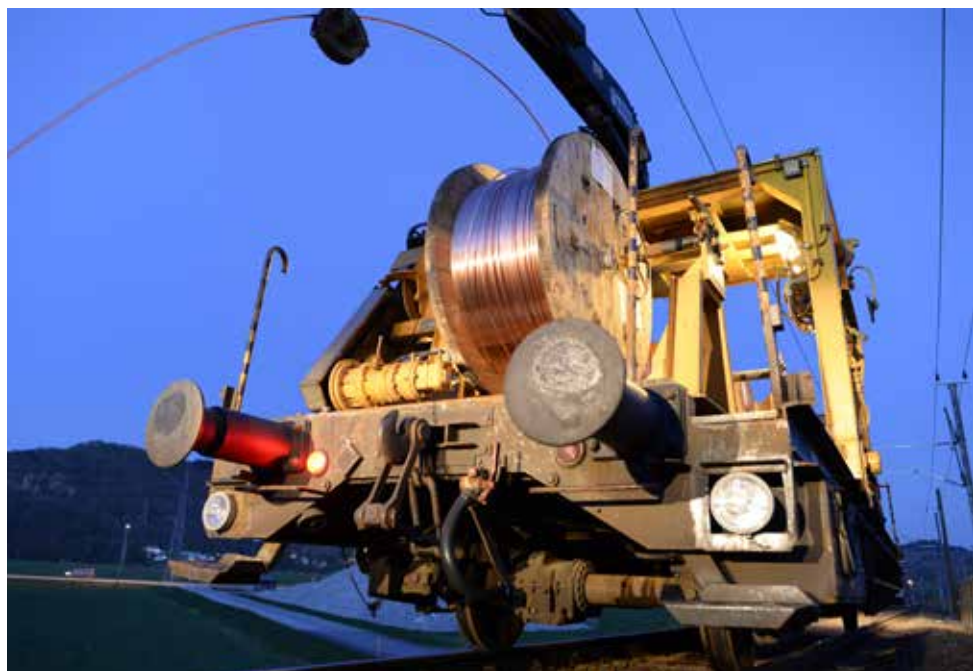
After finishing the electrification on these railway lines, passengers and freight carriers will be able to enjoy far better transport services in the area. The new passenger trains will be modern, more comfortable, offer better accessibility and have twice as many seats as today. On the Meråker Line, freight operators will be able to take advantage of heavier and longer trains, and be able to use electrical locos the whole journey. This makes logistics easier for freight

operators. The engine noise from electrical trains is significantly less than from diesel engines. The annual reduction in greenhouse gas emissions as a result of the electrification is estimated at about 9,000 tonnes of CO<sub>2</sub> equivalents (figures from the Norwegian National Rail Administration and NSB). Around 75% of the reduction is due to the transition from diesel to electrical trains. The remaining 25% is due to the expected transfer of traffic from cars and buses to trains. This annual reduction in greenhouse gas emissions as a result of the electrification is equivalent to emissions from 4,400 cars with average annual mileage, or 233,000 round trips by car between Trondheim and Steinkjer.

2015 and 2016 have been devoted to planning. Construction is scheduled to start in spring 2017. The project will be completed by 2023. A total of 200 km of railway tracks will be electrified during the project.

The electrification of the Trønder- and Meråker Railway Lines involves an investment of approximately NOK 3 billion. The project is part of the Norwegian Transport Plan (NTP) 2014–2023.





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## What are we going to build and how?

Electricity for the Trønder- and Meråker Railway Lines will be supplied by 10-metre-high steel masts fitted with live wires. These masts will be mounted on buried concrete foundations, spaced about 40 metres apart along the line. High voltage overhead power lines (OCL and AT-system) will be mounted on the masts to supply trains with electricity.

In order to supply the trains with electricity, we also need to build two converter stations – one at Eidum near Hell and one at Heggesenget near Steinkjer. The converters will be electrically fed from network companies, the current will be converted from 50 to 16,7 Hz and supplied via the AT-system and the OCL to the trains.

It is important for the trains to have access to the correct power output along the entire

stretch. Therefore, in addition to these two converters, Jernbaneverket will build a number of auto transformers (AT), which will be installed along the line every 10 kilometres. Construction work will mainly take place on property owned by Jernbaneverket, i.e. along the railway line and within a distance of 5 metres from the line.

The power supply system will be high voltage – 15,000 volts.

- ▶ 200 kilometres of track will be electrified
- ▶ 4,700 masts and foundations
- ▶ 690,000 m of high tension wires
- ▶ 23 AT transformers
- ▶ 2 converter stations

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## The Stavne–Leangen bypass will be first

The Stavne–Leangen Line in Trondheim is a 5.5 km stretch of non-electrified railwaytrack that connects the Dovre Line with the Norland Line, bypassing Trondheim Central Station. The Line is described as a curiosity in our railway history. The Germans started construction on the line during WW2 as an alternative route in case of sabotage. At the end of the war, it was only halfway completed, not least because of the difficult blasting work in the 2.8 km long Tyholt tunnel. The section of railwaytrack is 5.8 kilometres long and was finally opened in 1957 and will be the first railway line to be electrified for this project.

Lerkendal (opened in 1988) is the only station along this stretch, which makes it a perfect testing ground for the longer routes to be electrified later.

Once the stretch has been electrified, it will make an important contribution to relieving traffic at Trondheim Central Station, partly because freight trains heading north will be able to bypass the city centre. The stretch will also be important as backup, in the event of any problems with the railway bridges in the centre of Trondheim.



Tyholt tunnel



Lerkendal Station





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## Connecting Trøndelag

Jernbaneverket hopes that this project will strengthen the competitiveness of the railway by improving the service offered to passengers and freight traffic on the Trønder Line.

The Trønder Line is a name that was originally adopted by the NSB in the early 1990s. It was a collective term for the local trains around Trondheim, including the stretch between Trondheim and Steinkjer. Today, The Trønder Line is used colloquially to refer to all the trains on the stretch between Støren and Steinkjer. The Dovre Line has already been electrified. Nevertheless, electrification and other improvements on the stretch between Trondheim and Steinkjer will also have a positive effect for passengers on the

part of the line to the south of Trondheim because of the increase of all traffic on the Trønder Line.

In addition to the electrification of the line, a number of other measures will be implemented to increase the competitiveness of the Trønder Line. New bridges and a new double-track railway on the stretch between Hell and Værnes, upgrades to stations and stops and more passing loops are part of this initiative.

Now that the two counties in the Trondheim area are to be merged, an electrified Trønder Line will offer a better transport solution which will benefit the new Trøndelag county.

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## Connecting with Sweden!

The Meråker Line is the 74 km long stretch between Hell and the Swedish border at Storlien. The track has already been electrified from Storlien Station down to the Norwegian border, electric trains have yet to run on this stretch.

There is currently no passenger traffic and very limited freight traffic on this stretch. The electrification of the Meråker Line will offer better service to both freight and passenger customers, which in turn presents excellent opportunities for business and tourism in both countries. Jernbaneverket will

supply a solution with a continuous electrical railway line from Eastern Norway, through Sweden and back into Norway through Stjørdalen.

The Meråker Line has a bit of a gain in altitude. This has a direct impact on diesel consumption and results in relatively high CO<sub>2</sub> emissions. An electrified track will allow operators to run heavier and longer trains with zero greenhouse gas emissions because electrical locomotives are more powerful than diesel locomotives.



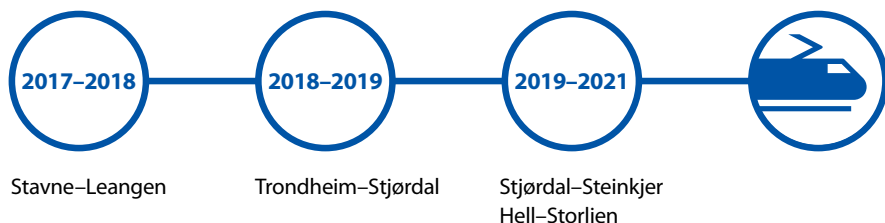
View from "Stora helvetet"





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## Schedule for the electrification of the railway lines



**Please contact us if you have any questions about the project.**



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