

A man with a beard and long hair, wearing a dark beanie and a dark jacket, is looking down at his wrist where he is wearing a watch. He is smiling slightly. The background is a blurred cityscape.

Jarðstrengir í flutningskerfinu

Raffræðilegar takmarkanir

Magni Þór Pálsson

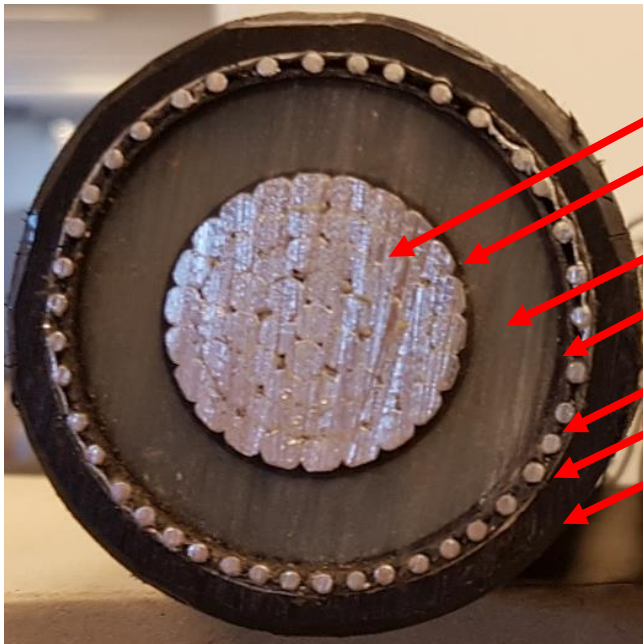
Verkefnastjóri rannsókna hjá Landsneti

22.11.2022

LANDSNET

Mismunandi uppbygging

Jarðstrengur

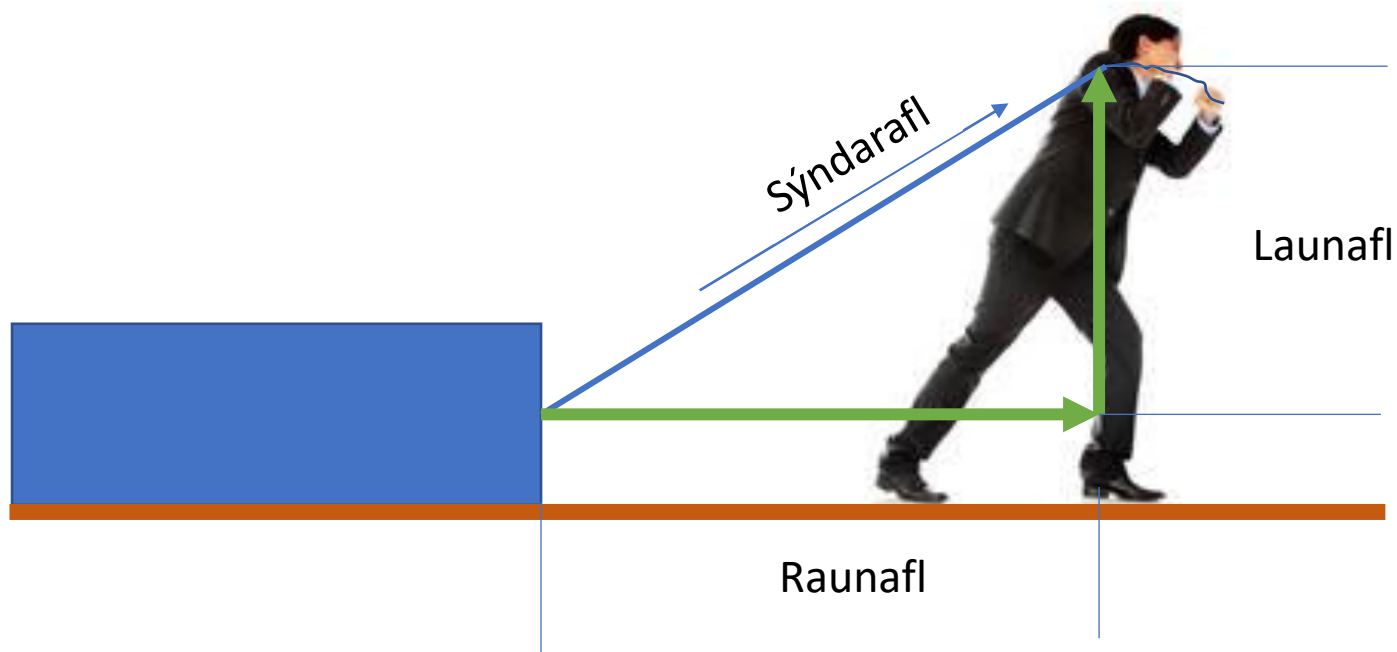


1. Leiðari
2. Leiðaraskermur (innra hálfleiðandi lag)
3. Einangrun
4. Einangrunarskermur (ytra hálfleiðandi lag)
5. Skermleiðari
6. Málmvafningur
7. Kápa

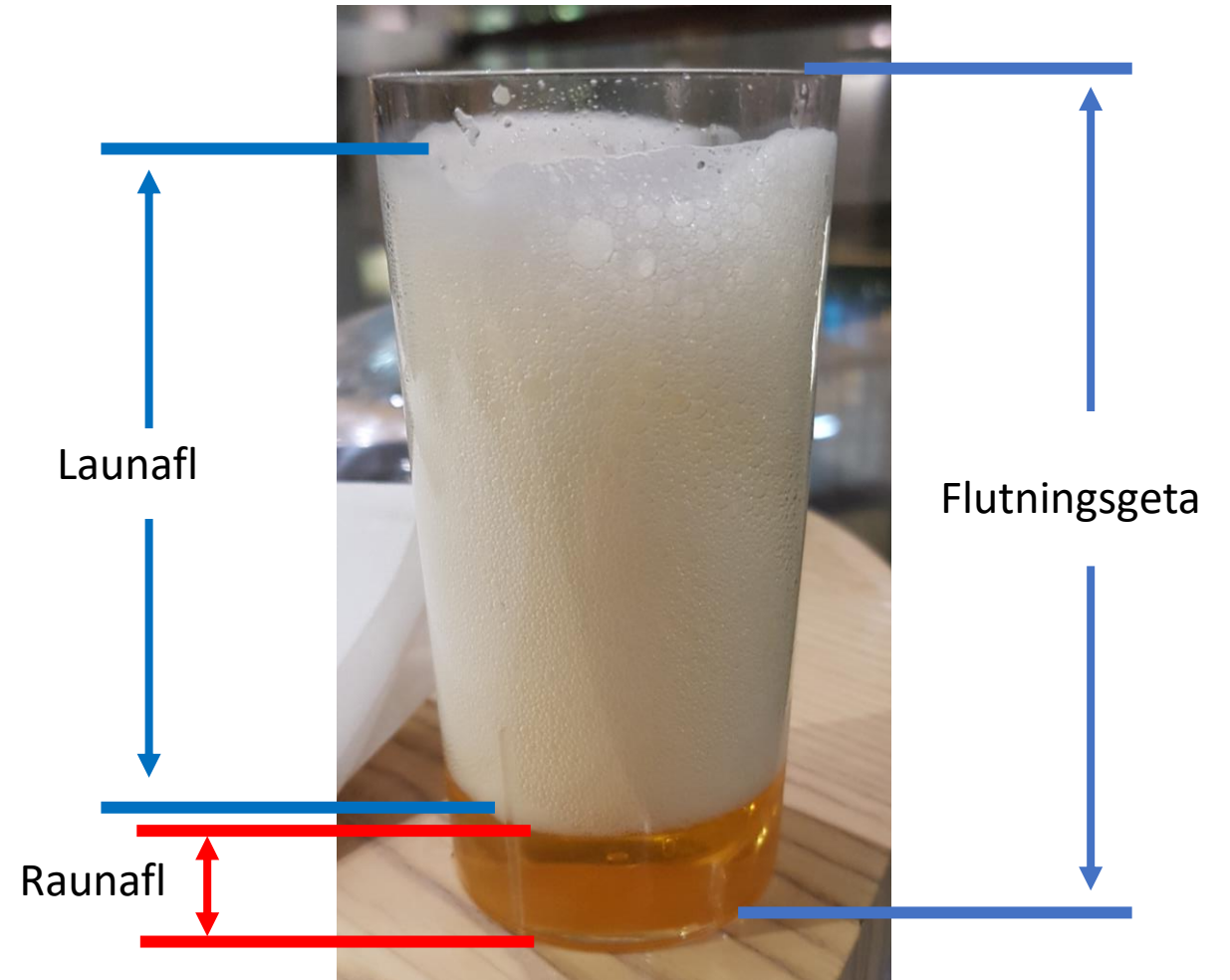
Loftlínuleiðari



Raunafl, launafl, sýndarafl



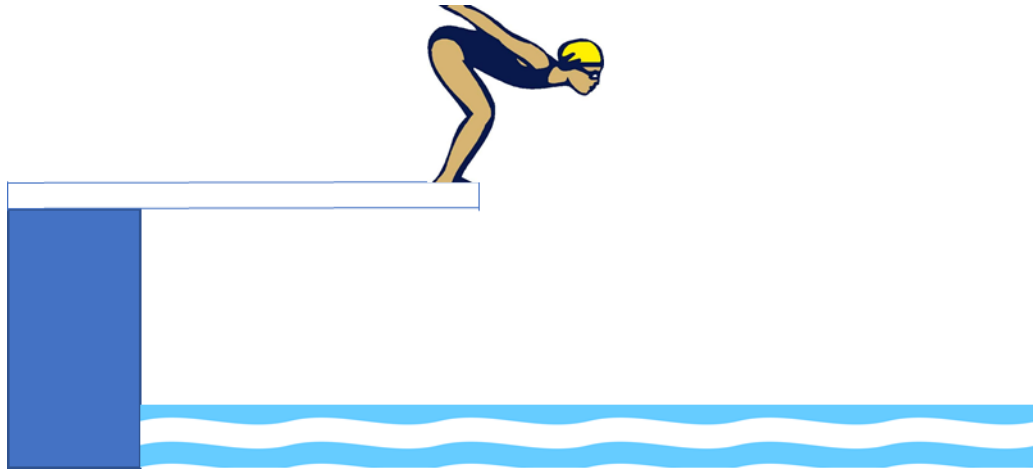
Launafl



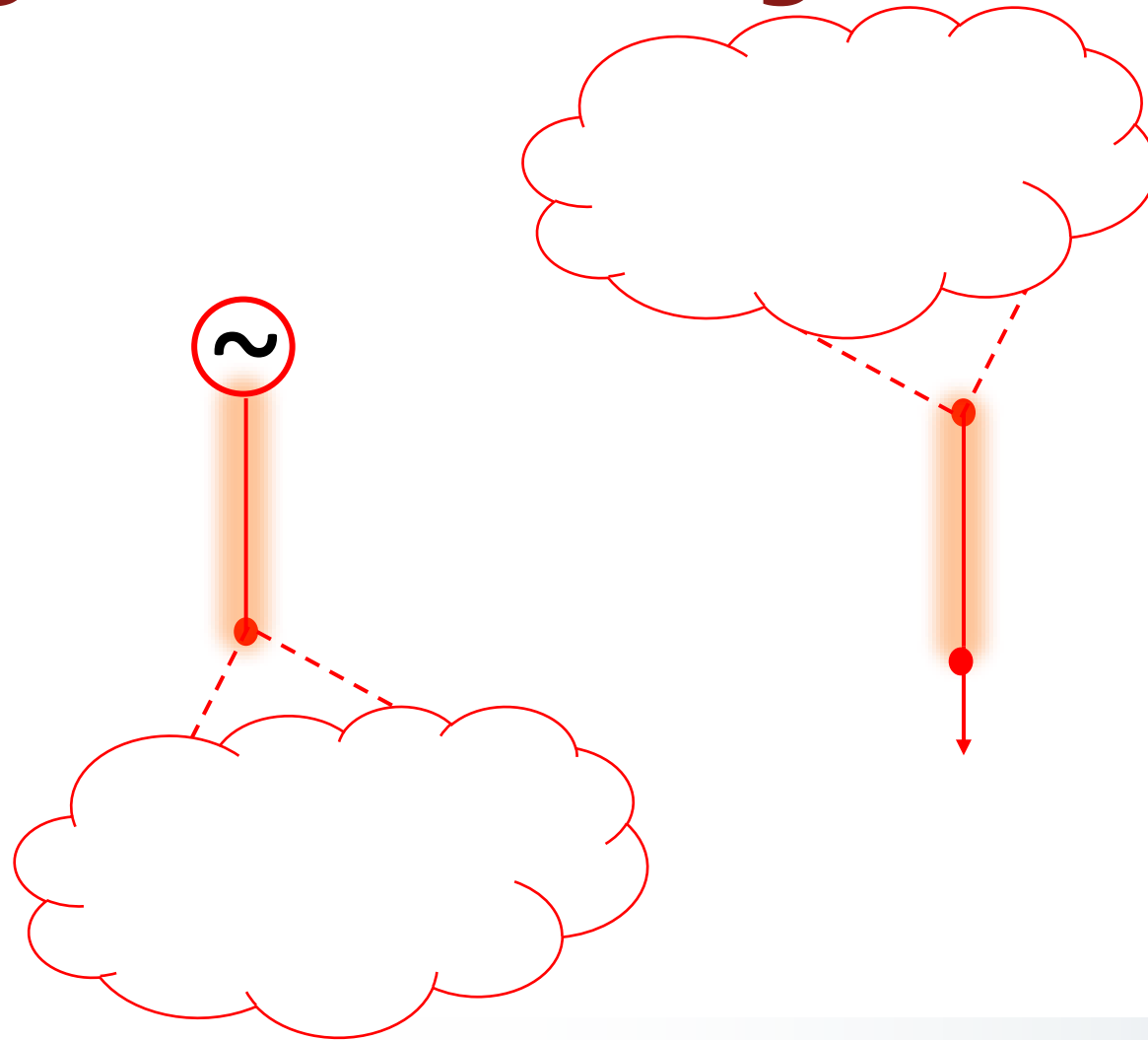
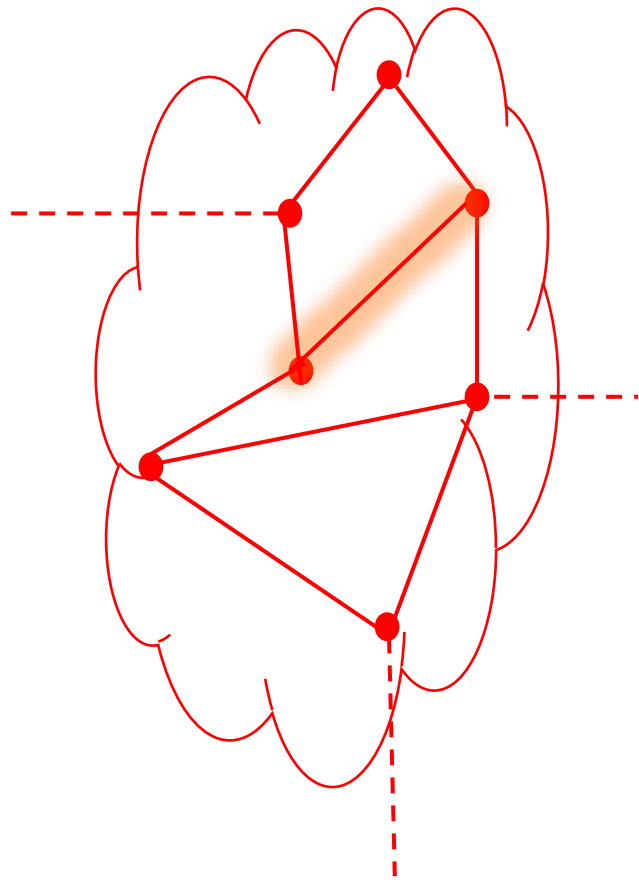
Launafl og styrkur kerfis

- Launafl er gagnlegt upp að vissu marki
- Launafl hefur áhrif á spennu í kerfinu
- Launafl er í hlutfalli við spennuna í öðru veldi
- Samspil launafls og kerfisstyrks í tengipunkti ráðandi þáttur varðandi mögulega jarðstrengslengd
 - *Spennuþrep*
 - *Yfirtónamögnun*
- Kerfisstyrkur misjafn eftir landsvæðum
- Í samtengdu kerfi hefur jarðstrengur í einni línu áhrif á mögulegar jarðstrengslagnir í annarri (öðrum) línu(m) innan sama svæðis
- Þetta á líka við á milli spennustiga!

Sterkt kerfi vs veikt kerfi



Staðsetning og hlutverk strengs



The Grid West Project



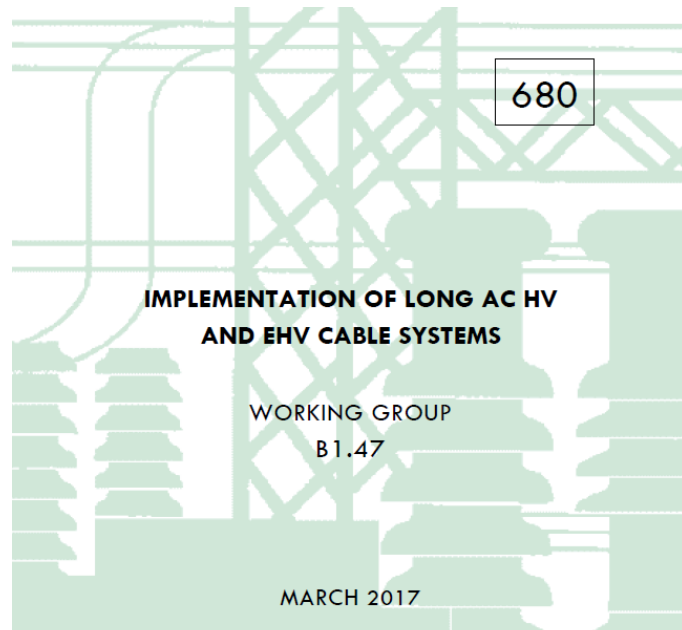
Report for the Independent Expert Panel

Volume 1 Main Report

220kV UGC is a standard technology in use on the Irish transmission system. However, given its characteristics, there are limits to how much can be used in any area and use on one project reduces the amount of underground cable that can be used on future development. A partially undergrounded 220kV solution is typically employed in limited circumstances, such as major water crossings, when traversing densely populated or congested areas.



Kerfisgreining er undirstaðan!



- Ítarleg kerfisgreining nauðsynleg
- Áhrif strengs á kerfi og nauðsynlegar aðgerðir háðar nokkrum þáttum
 - Spennustigi
 - Kerfisuppbyggingu
 - Skammhlaupsafli
 - Hlutverki strengs í kerfi

Hence for the reliable application of long AC cable connections detailed system modelling studies are necessary. If the study results show that resonance or unacceptable amplification of higher harmonics can occur, then suitable measures must be taken. Naturally this depends on the nature of the identified problem and the severity so that the best countermeasures can be taken.

The extent to which an AC grid is influenced by the application of underground cable and the amount of measures that must be taken varies significantly depending on the voltage level, the grid configuration, the short circuit level and the reason for the cable in the power system.



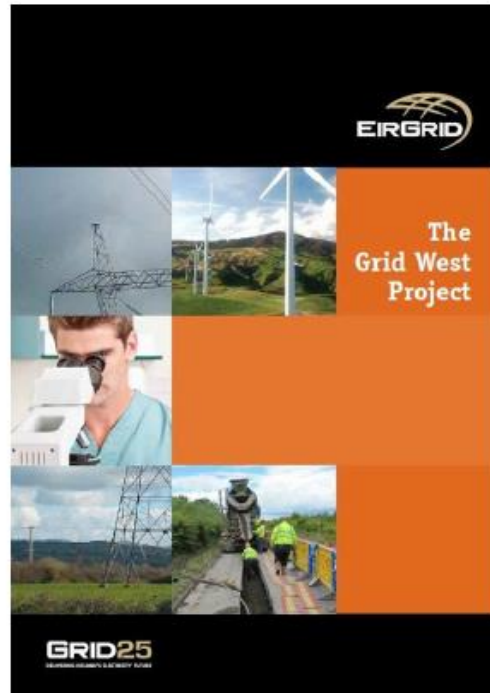
Jarðstrengslengdir í meginflutningskerfinu

Mat á mögulegum jarðstrengslengdum í nýju 220 kV
flutningskerfi á Norðurlandi
Kerfisgreining

EirGrid

10344 – PSP019 - AC CABLE STUDIES FOR GRID WEST

Full and Partial AC Underground Solution



Main Report

30/01/2015

Partial Underground Option

Meets the Need	✓
Present Value	€207.4M – €249M
Construction	3.5 years
Longevity and Flexibility	Moderate
Amount of Undergrounding	Maximum of 30km for the region

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TEKNISK REDEGØRELSE: OP TIL 15 PROCENT AF 400 KV ELFORBINDELSE KAN GRAVES I JORDEN

PUBLICERET D. 1.10.2018 14.00

Det vil medføre betydelige risici og kan påvirke både Danmarks forsyning og forbrugernes elapparater, hvis lange stræk eller hele de planlagte 400 kV-forbindelser i Vest- og Sønderjylland lægges som kabler i jorden. Teknisk redegørelse til ministeren viser, at op til ca. 15 procent kabellægning er muligt.

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Dato:
28. september 2018

NOTAT

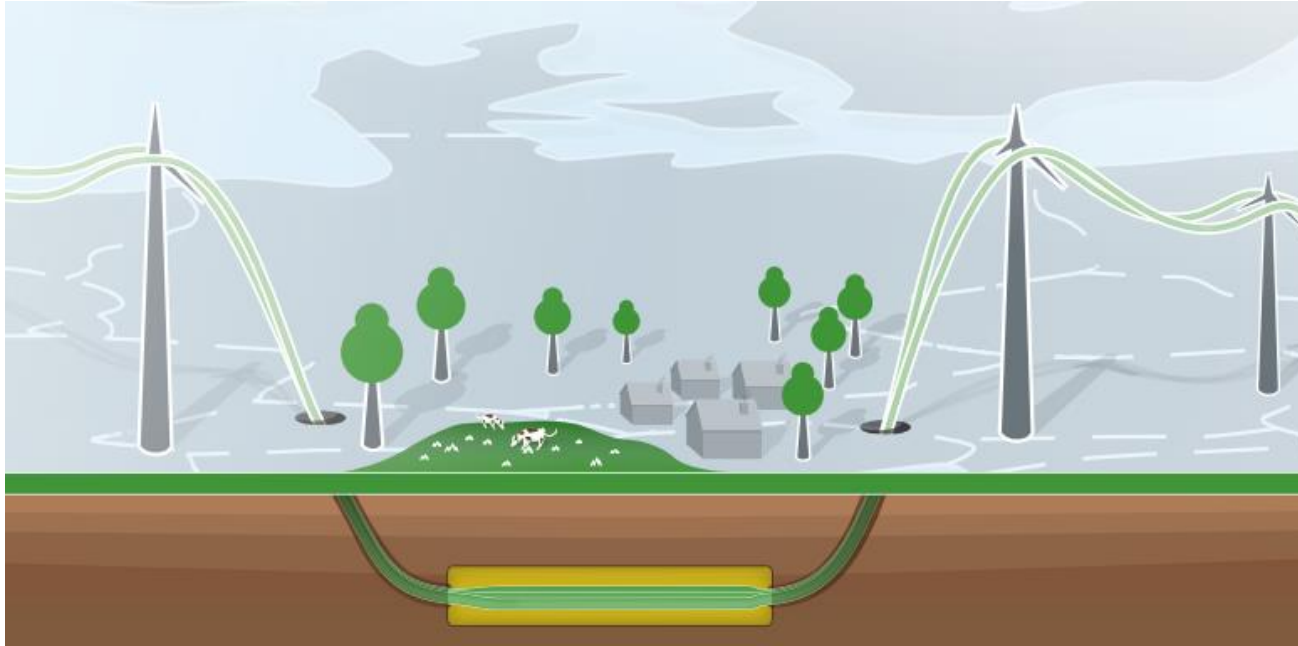
DANSK RESUMÉ – TEKNISK REDEGØRELSE OM ANVENDELSE AF KABELANLÆG VED UDBYGNING AF 400 KV-NETTET I SYD- OG VESTJYLLAND

3. Fremtidsperspektiv:

3.1 Elnettet forandrer sig – kabler skal bruges med varsomhed

Transmissionsnettet er et stort sammenhængende net, og mange kabler ét sted begrænser muligheden for anvendelsen af kabler andre steder. I fremtidens udbygning af transmissionsnettet vil der sandsynligvis også blive brug for at kabellægge nær særlige naturområder eller nær byer. Samtidig vil der blive introduceret endnu flere kabler i transmissionsnettet i forbindelse med nettilslutning af kommende havmølleparker.

„Blönduð leið“



The Europacable Concept of Partial Underground

FACILITATING PUBLIC ACCEPTANCE THROUGH UNDERGROUND

The Europacable Concept of Partial Undergrounding foresees the undergrounding of power lines, complementing overhead lines where their deployment is restricted by public acceptance or environmental constraints.





