



Statens vegvesen

NPRAs Action plan 2020-2030

Action plan for improved sustainability in infrastructure projects

—
Focus om reducing direct climate gas emissions with 55 %

Per Fjeldal, Construction Department, NPRA

Foto: Statens vegvesen



The original action plan – adopted October 2023

- 55 % reduction of the emissions 2020-2030 is the main goal
- Milestone January 1, 2028 : Zero emission in contracts (main rule)
- NPRA should be a predictable early market



... full speed in large projects 2024

Examples

- E134 Røldal-Seljestad; **emission-free mass transport** at one tunnel end + **machinery requirements**
- Rv. 13 Lovraeidet-Rødsliane; **emission-free mass transport** at one tunnel end + 50 % on the other + **machinery requirements**
- E134 “Oslofjord 2”; 50 % **emission-free mass transport** + **machinery requirements**
- E6 Megården-Sommerset; various **machinery requirements**
- Rv. 162 “Ring 1”; **100 % electric mass transport**; various **machinery requirements**



March 2025: Revision of the plan

- Implementation of new procurement regulations § 7-9
 - Stricter legislation for **ALL** public procurements
 -
- In the revision we decided that our policy should be **requirements** not award criteria's
 - However, award criteria's may be added “challenging the industry”
 - ...when we are not sure specific requirements are possible to fulfil
 -
- Revision reflect new technology, and lower costs
 - Mass transport: **Zero emissions in 2025 as the main rule**
 - We require tunnel production **as close to zero as possible**
 - For excavators and wheel loaders: % requirement or machine hours related to the size of project
 -
- Still aiming for emission-free construction sites in contracts from 1 January 2028
 - Final implementation will be decided by our Director during 2027



Handlingsplan for direkte klimagass- utslipp fra utbyggingsprosjekter

55 % reduksjon 2020–2030

STATENS VEGVESENS RAPPORTER

Nr. 949



Procurement regulation § 7-9

- Aims to reduce the overall climate footprint and/or environmental impact of public procurement
 - Emissions from conventional machinery are significant, hence climate must be given priority
 - Main rule: at least 30 % priority in **award criteria's**
 - When it gives a better climate effect: Climate and **requirements** may replace award criteria
 - Currently, we see that **requirements provide the best effect** and most predictable results
- Additional costs must be expected
 - According to background literature and recently published reports
 - How much... "Depends on the nature of the procurement"
- Based on previous estimates: 2-3 % additional cost for 30-50 % reduced emissions.
 - In 2030-32 additional costs will converge to zero



Cost-effective measures

- New knowledge on machine availability and costs for zero emission last two years – is included
 - Experiences from several pilot projects
 - Great inspiration –the city of Oslo require zero emission /biogas on all their construction sites!!
- Input from the Norwegian Environment Agency
 - Expertise in economic analyses, general climate measures
- Information from ENOVA
 - Support schemes zero emission machines and vehicles
 - Market surveillances
 -
- NPRA has adopted standard requirements on machines, trucks, heating etc.
 - Based on cost effectiveness
 - Published to secure transparency in the market



National Transport Plan 2025-2036: Electrification of trucks

- Most important climate measure in the transport sector
 - If no new politics are introduced, heavy vehicles in Norway will soon account for the largest share of the road emissions
- Mass transport on public roads accounts for approx. 30 % of total emissions from heavy vehicle in Norway
 - Local/regional transport and long-distance transport 30-40 % each
- 2030-target according to the government:
 - 100 % new heavy vehicles sold in 2030 to be zero-emission (or biogas)
- Support for charging infrastructure
 - Charging at rest stops + charging stations suitable for heavy vehicle charging
- Massive Enova support for heavy vehicles

***Requiring zero emission in our projects now,
we contribute to achieving the governments
sales target for trucks in 2030***

Meld. St. 14

(2023–2024)

Melding til Stortinget

Nasjonal transportplan 2025–2036



Transportation of stone and masses - a low hanging fruit!!

- EU requirements for type-approved emissions is important
 - WLTP introduced for trucks – as for cars
 - Manufacturers must deliver zero emissions to avoid large fines
- Additional cost for trucks today in Norway is significantly lower than construction machinery
 - Enova supports up to 60% of the additional cost (2024)
 - TCO is lower for BEV than for fossil vehicles from 2025
 - Investment cost may be a burden for smaller entrepreneurs
 - Still some uncertainties on resale value, durability etc.
- On the construction sites: Mass transport requires less adaptations than excavators
- Volvo and Scania accounts for almost 90% of the market
 - Volvo can deliver volumes now – the ordering time is as short as for conventional vehicles
 - Scania; some delivery problems – soon to be resolved
 - MAN trucks and Mercedes delivers from 2026
- Large dump trucks are available on the market
 - Tested on several sites already
 - Dump trucks have a slighter higher cost than trucks
 - At least four-five alternatives available by 2026



Allow biogas where we need to...

Biogas provides climate cuts, but low energy efficiency compared to electric trucks and local emissions makes it a second priority

Biogas is relevant where zero emission is not possible or expensive

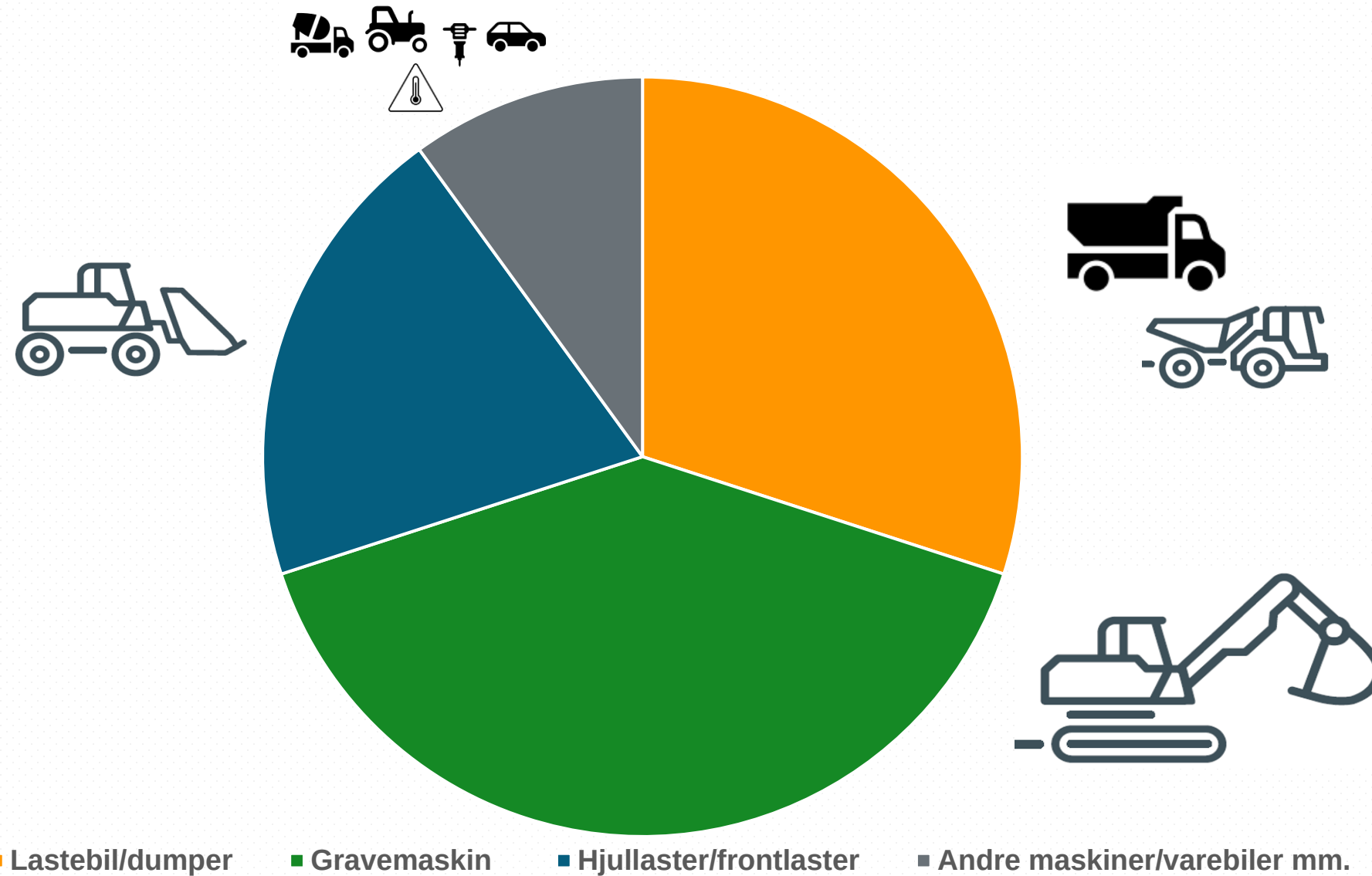
- Electric energy is not available
- No charging superchargers in the surrounding to the site

Biogas cannot be used for construction works in tunnels

- Due to national legislation
- Excludes the use on many construction sites



Direct emissions from construction sites incl. mass transportation to landfill



Tunnels – we are almost there...

All larger NPRA-projects includes tunnels to some extent.

Mass transport is the major remaining source of climate gas emissions in building tunnels

SVV already requires hybrid machines for stone loading

- Pure electric operation is possible within a year

Other «drill and blast»-operations are mainly cable electric:

- ventilation
- drilling
- coring
- injection

Hybrid drilling – may be substituted with all-electric in near future

Emission-free finishing work in tunnel is possible:

- bolt rig
 - work platform
 - spray robot
 - element setter
 - grease pump/bolting
 - guardrail rig
- Some of the processes are using cable today – we may now add requirements for “all electric”

Synergies by eliminating the use of diesel use in tunnels

- Improved working environment
- Reduced ventilation costs



Other machines or processes

- Crushing of stone + stone loading – cable electric
- Heating/thawing/hardening of concrete – fossil free

Upcoming 2025-2026

- 2nd gen battery excavators up to 30 tons on the market
 - 55-ton battery/battery + cable on its way 2026
- 40-tonnes battery-wheel loader by beginning of 2026
- Large asphalt paver to be tested 2025
 - Battery electric roller is already available for rental
- Concrete delivery + drumming “on site”
- Hybrid mobile crane – possible for rental
- Pile driving, piling, drilling – already tested at sites
- Demolition, studding



GJENVINNING PÅ STRØM: Dette knusverket fra Keestrack er beregnet på gjenvinning og kan fås med eller uten motorpakke. Fredheim Maskin

Tror fremtiden er kabel-elektrisk på alle knuse- og sikteverk

PUBLISERT 11.01.2025 - 18:00



PEAB ASFALT: Tester batterielektrisk asfaltutlegger fra Ammann ABG i Sverige. Magnus Rockler / Ammann

Testes i Sverige før lansering på Bauma

PUBLISERT 29.11.2024 - 14:50



Energy plan – an important tool

The contractor shall submit an energy plan for the construction site,

According to NS/TS 3770:2023 – national standard

The following shall be described:

- **How many machines** and other loads will be used on the construction site
- How much **energy** will be used on the site per day
- Type and **number of construction machines**
 - Other large loads **in the various construction processes**
- Which **energy type** and how much energy the machines will use – **detailed**
- **Maximum load** for the entire construction site
- **Overview of electrical connection points** on the construction site (spatial distribution)



Is it achievable to reach the goal of 55 % reduction by 2030?

We need volumes of large battery-electric excavators 40 - 55 tons

- They may account for >50 % excavator-emissions on **larger** projects
- Cabled excavators may be used for some applications – but not all
- A mix of battery and cable may be a solution?



Develon 55 ton battery electric excavator, converted by Staad, NL, 2025,



LIUGONG 960FE Electric Crawler

The joint project railway/road E16 Arna-Stanghelle must succeed with “near zero”

- The project is highly motivated – and has goals for near zero emissions!

We must capture "all the small decisions" in smaller projects too

- All smaller projects must do “their homework” with establishing power access – and put up standard requirements
- Projects that starts from now on, may achieve 50-60 % reduction in direct emissions without major additional costs
- Rental marked will be important in the coming years when many machines are to be phased in



Statens vegvesen

Takk for meg

Per Fjeldal, Statens vegvesen



Foto: Bård Asle Nordbø