

## Panel 2 – Innovative Energy Efficient Operation

---

# EETROP – The Key to Efficient Railways

Esbjörn Eriksson  
Transrail Sweden AB



## Scope

**E**nergy

**E**fficient

**T**Rain

**O**Peration

**EETROP**

## Why EETROP?

**The completeness**

**The integration**

**The costs**

**The interoperability**

**EETROP**

## EETROP – Savings

**E**nergy – Less

**E**mission – Less

**T**raction – Less

**R**esource – Less

**O**perator – Friendly

**P**ersonnel – Friendly

# EETROP

## WP2.3 – Activities performed & Status

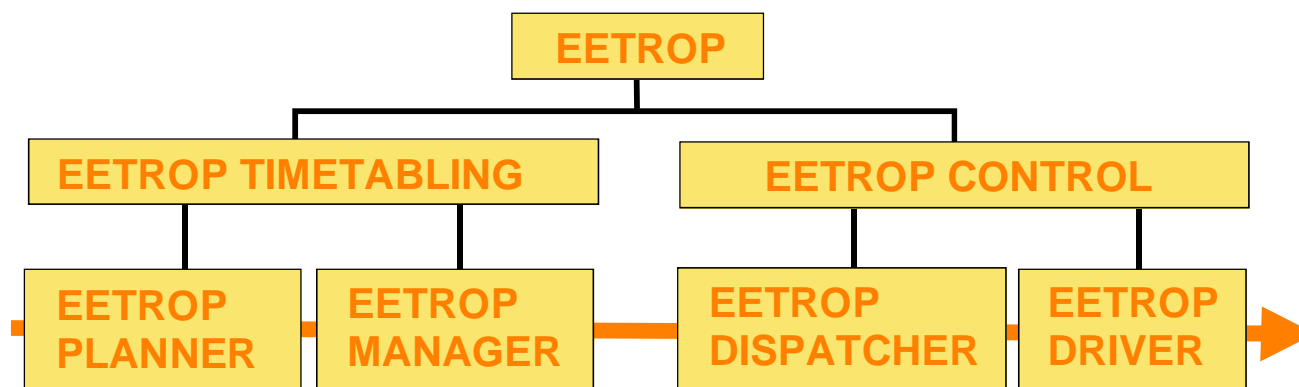
- Defining EETROP [10]
- Investigating EETROP [9]
- Creating SRS for EETROP Timetabling [9]
- Creating SRS for EETROP Control [7]



## The EETROP concept

EETROP operates in four contexts:

- EETROP Planner:** Energy and power in seasonal timetabling
- EETROP Manager:** Energy and power management on a daily cycle
- EETROP Dispatcher:** Real time energy/power based traffic control
- EETROP Driver:** Optimal driving to given individual target points



## EETROP Planner

- Seasonal planning
- Energy planning layer

### Working to

- Smoothen power peaks
- Improve recuperation of regenerative braking
- Open for use of EETROP Control

## EETROP Manager

- Short-term pre-planning (weekly/daily)
- Forecast power needs

### Working to

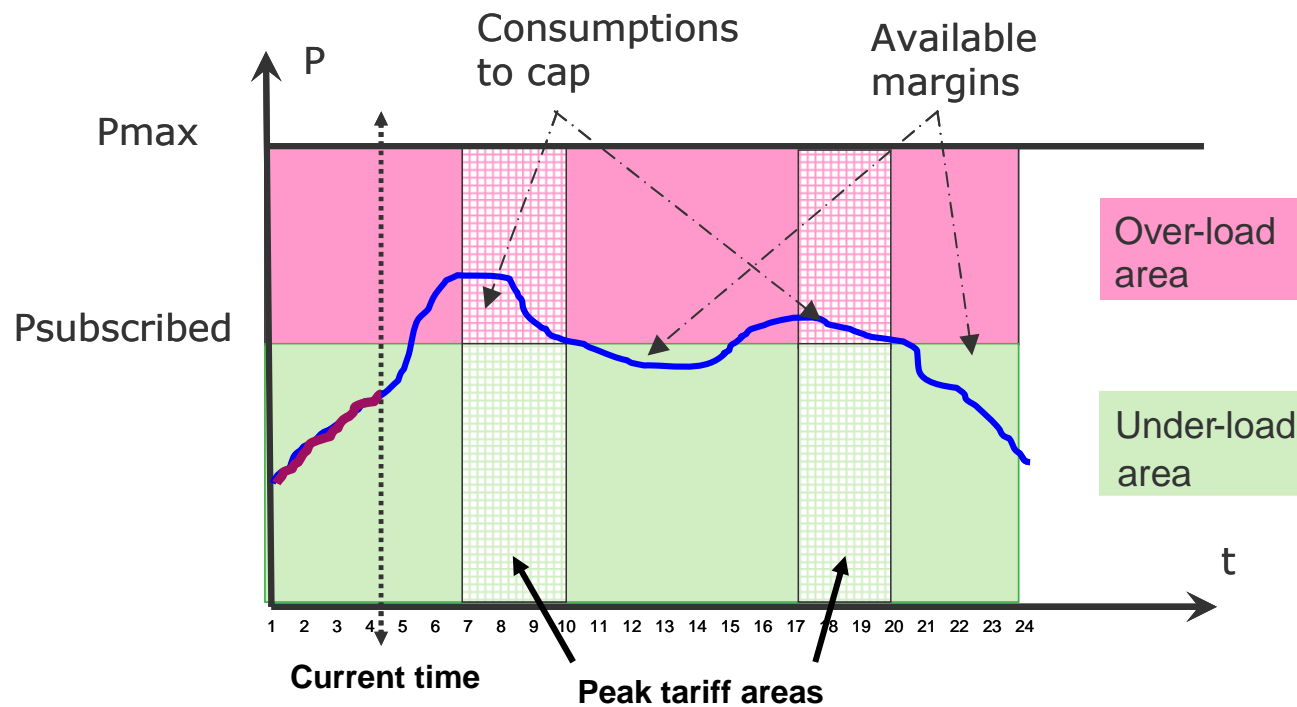
- Attend to power costs/tariffs
- Lower power costs
- Suggest power limitations
- Plan auxiliary energy use





## EETROP Timetabling SRS

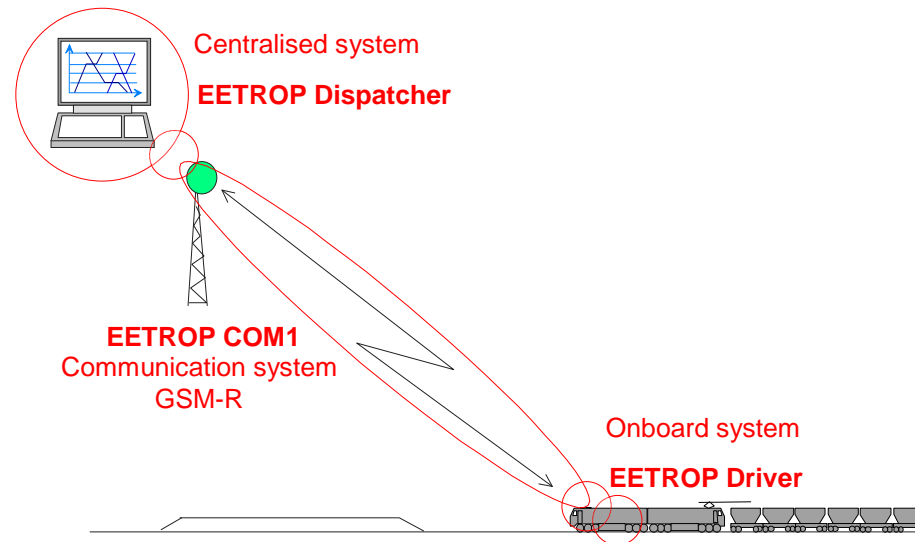
A framework for energy and power efficiency in timetabling





## Defining EETROP Control

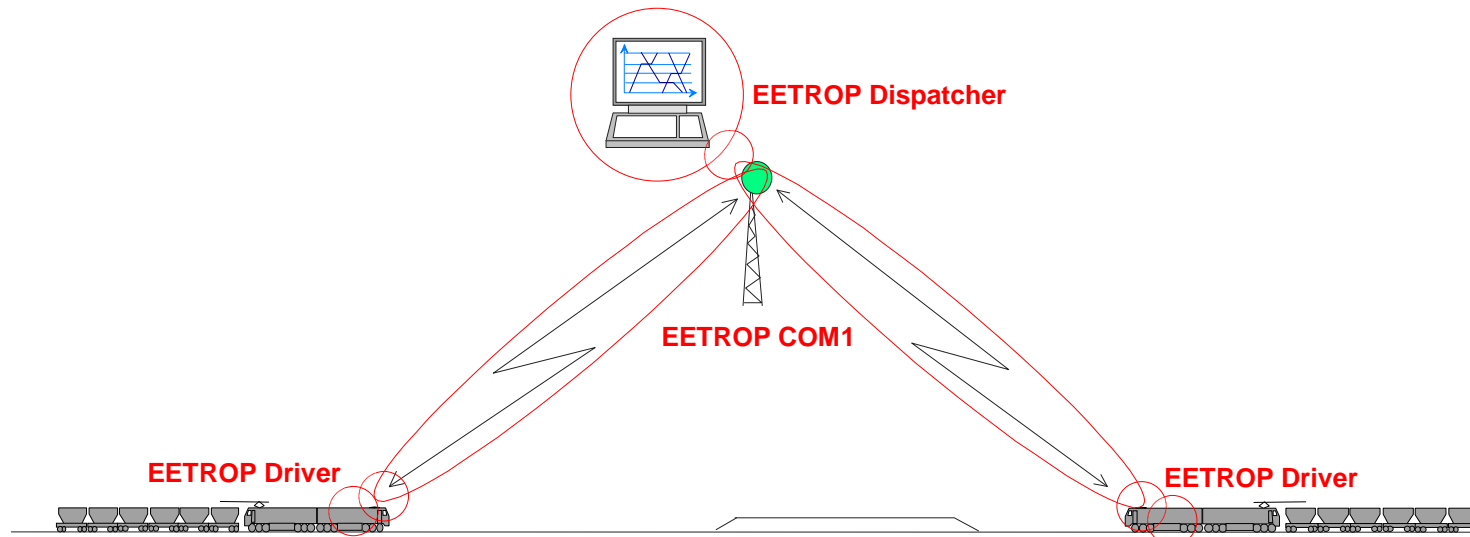
### Basic Configuration





## Defining EETROP Control

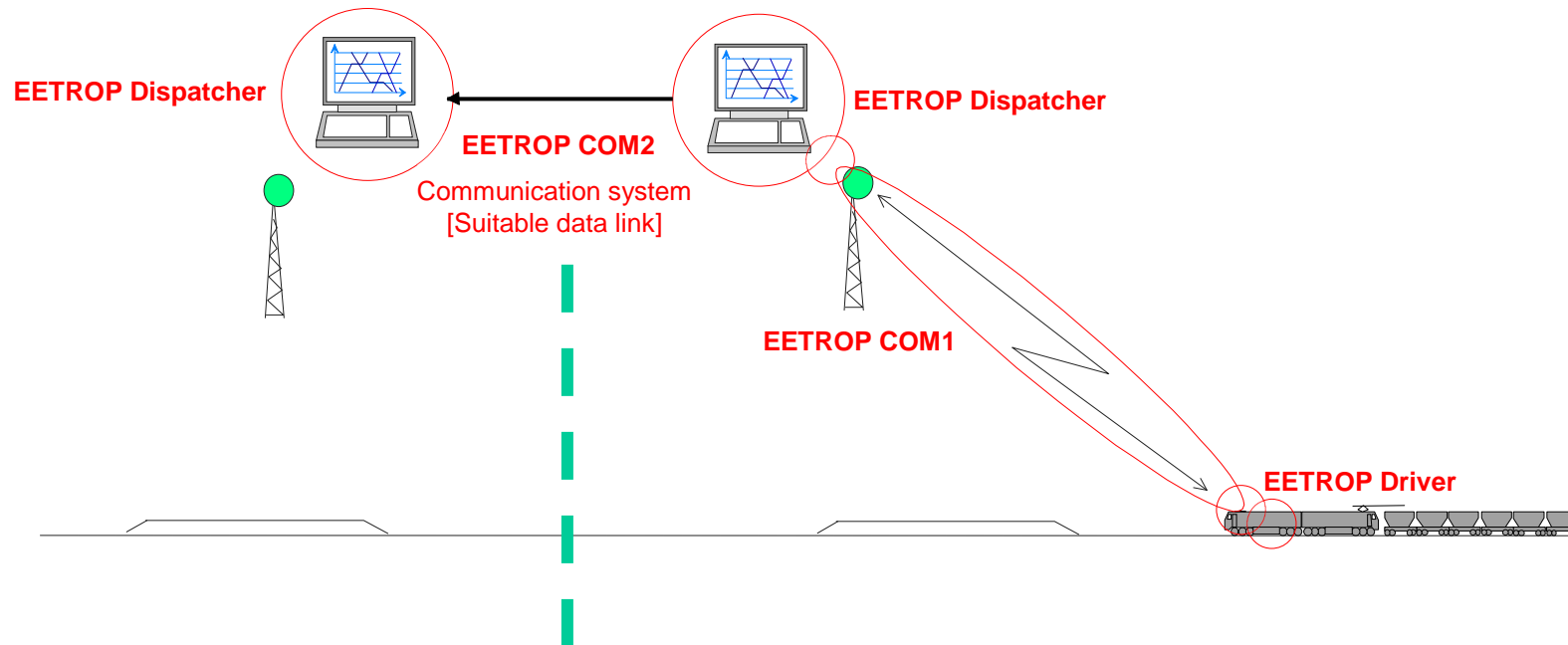
### Multiple Trains





## Defining EETROP Control

### Area Borders



## EETROP Dispatcher

- All trains
- Individual advice

### Working to

- Be interface to traffic control
- Handle train data
- Predict train movements
- Calculate and send target points to trains

## EETROP Driver

- Optimum control of the individual train

Working to

- Calculate the driving strategy
- Supervise fulfilment of strategy
- Report fulfilment of strategy (or not)
- Present driving advice

## EETROP Control SRS

- Defines an interoperable and seamless system for energy efficient driving
- Mostly an interface description
- Based on the SRS for ERTMS
- XML Schema defined messages

## **NOT** EETROP Control SRS

NOT specific hardware units, more a protocol

NOT conflict handling

NOT dispatcher interface

NOT driver interface



## Next Steps & Outlook

- EETROP Control – create a site
- Establish EETROP Control as a standard
- Establish EETROP Planner as a standard operation in timetabling
- EETROP Manager – create a site or test bed for power control



Thank you for your attention

**For further information:**  
**[www.railenergy.org](http://www.railenergy.org)**  
**[esbjorn.eriksson@transrail.se](mailto:esbjorn.eriksson@transrail.se)**

**transrail**