



**Global Centre of  
Rail Excellence**

# **Rail Scotland Conference**

**2<sup>nd</sup> March 2023**

**Kelly Warburton**

**Chief Commercial Officer**

# Changing Policy Context

## Net Zero:

**All governments across the UK have set out a commitment to reach Net Zero by 2045/50 – European nations too**

## Public Transport Infrastructure:

**Scotland's Climate Change Plan sets out a commitment to reduce car kilometres by 20 per cent by 2030**

**Wales Transport Strategy commits to increase to 40% the number of people making journeys by Active Travel or Public Transport by 2040 (up from 20% in 2019)**

## Innovation & Value for Money:

**UK Government has invested more than £150bn in the railways since the mid-1990s, but greater productivity and more innovation were two of the six problems identified by Keith Williams in his review of rail across Great Britain in 2021**







# Strategic Gap in UK and European Rail:

**There has always been a missing piece of the jigsaw in rail testing and, particularly, infrastructure innovation**

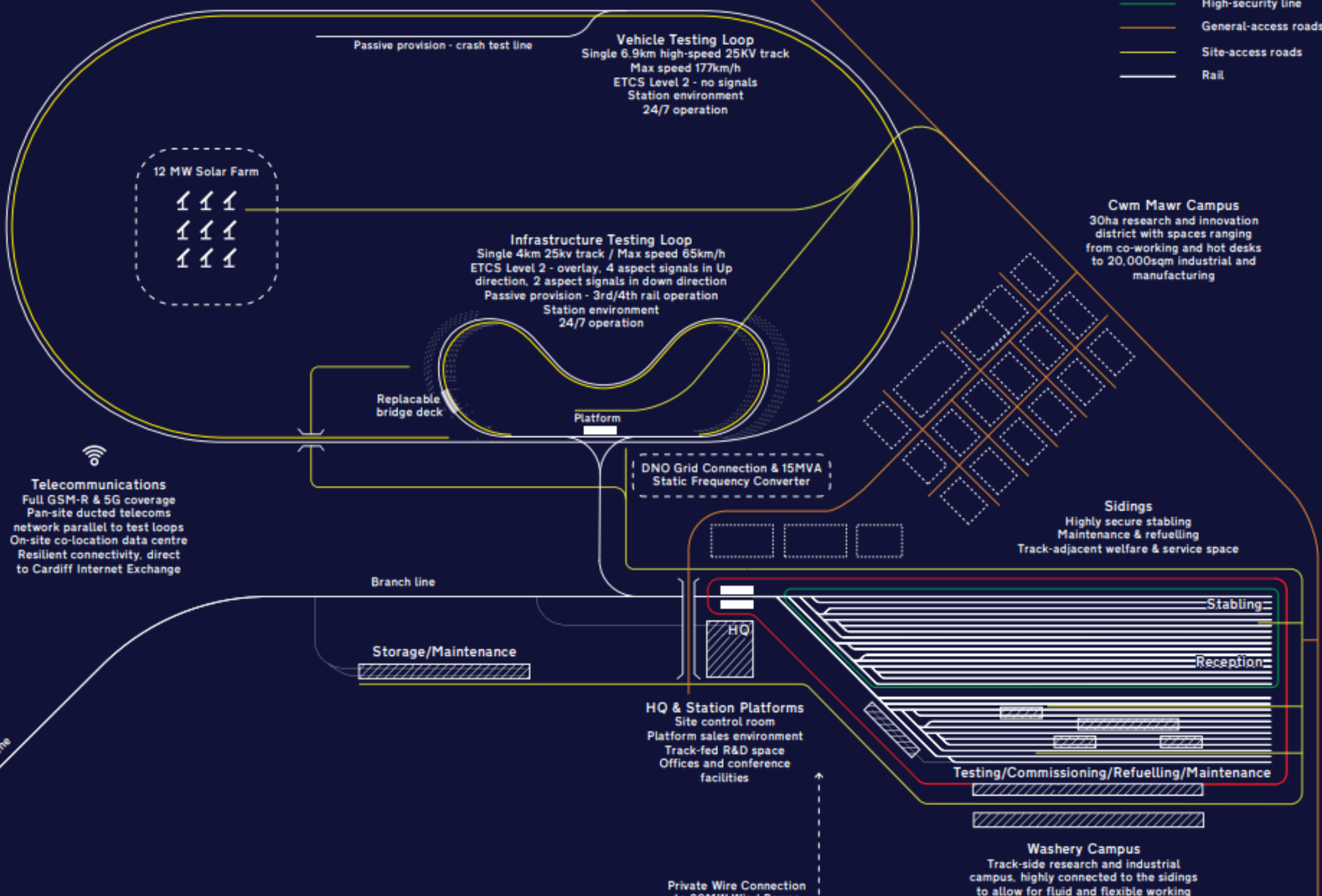
**The UK & Europe has lacked an integrated facility to test rail infrastructure, rolling stock, signalling and new technology and be a single site home to world class research and development**

**Infrastructure design and innovation in the UK has been slow to move on, with innovation being stifled so challenge to help Rail grow is real**

**Rolling stock is tested in over-subscribed European facilities and Infrastructure tested in USA**

## **Results:**

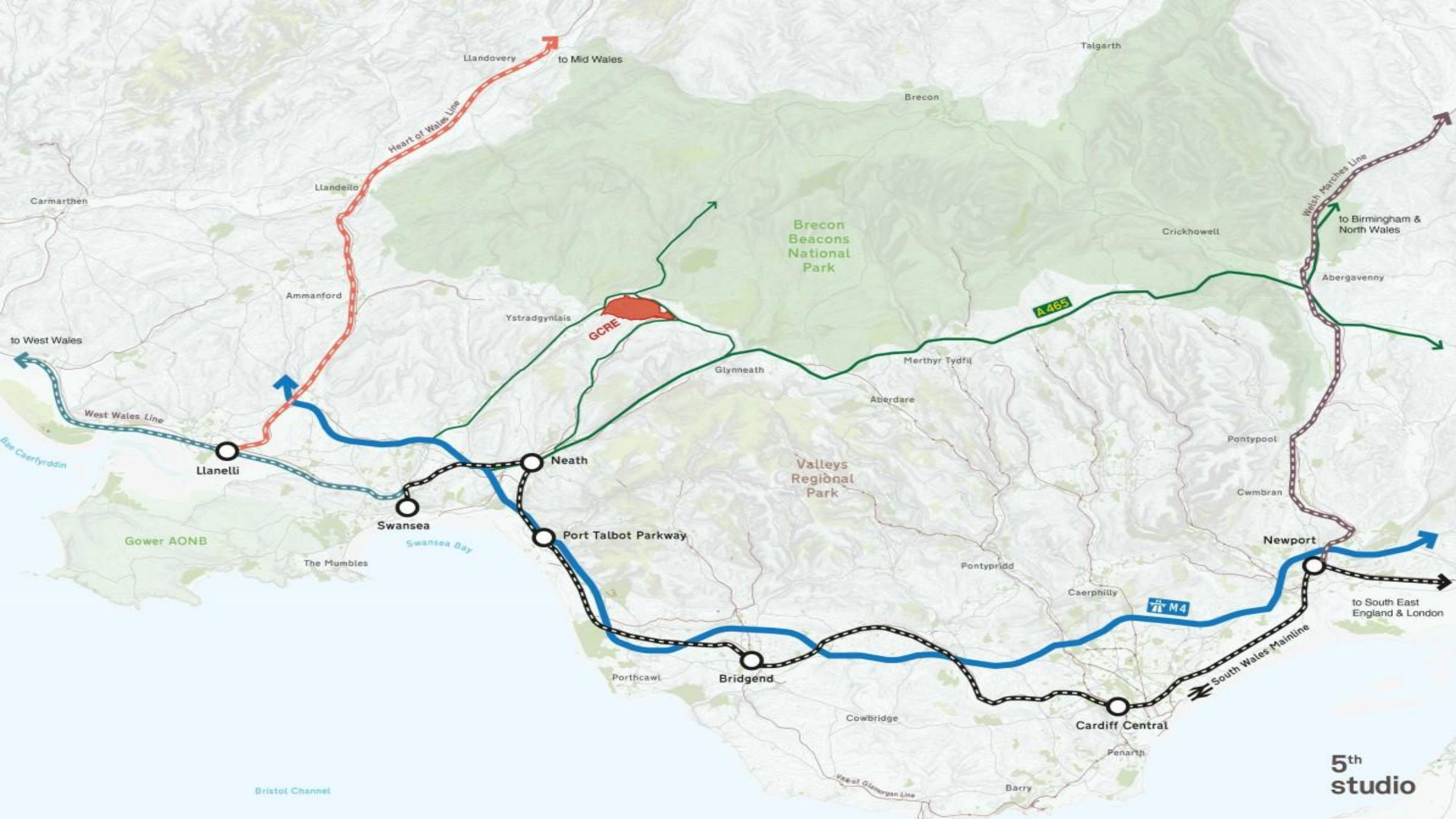
- **Innovation deferred, delayed or denied – standards lag not standards led**
- **System resorts to inadequate, fallback options – testing on the mainline**
- **Whole life endurance testing and validation of infrastructure not integrated**



- High-security line
- General-access roads
- Site-access roads
- Rail

to South Wales Mainline









Port Talbot

Neath

Swansea

Bristol Channel

Port Talbot

M4

South Wales Mainline

Swansea

Neath

to Fishguard

Neath Valley

Dulais Valley

Swansea Valley

Seven Sisters

Ystradgynlais

Vehicle Testing Loop

Onllwyn

Infrastructure Testing Loop

Future Campus

Banwen

Sidings & Depot

Caehopkin

A4221

Coelbren

Ynyswen

BRECON BEACONS



**SITE**

- A** Size: 23 hectares  
Usage: Solar energy generation  
Output: 16GWh
- B** Size: 11 hectares  
Usage: Solar energy generation  
Output: 8GWh
- C** Size: 11 hectares  
Usage: Solar energy generation or battery energy storage facility  
Output: 8GWh solar or 500MW/500MWh of battery storage
- D** Size: 16 hectares  
Usage: Battery energy storage facility  
Output: 700MW/700MWh
- E** Size: 8 hectares  
Usage: Battery energy storage facility  
Output: 350MW/350MWh
- F** Size: 4 hectares  
Usage: Battery energy storage facility  
Output: 175MW/175MWh
- G** Size: 12 hectares  
Usage: Green Hydrogen production facility  
700MWe of electrolyser installed capacity
- H** Usage: Wind turbines - 5 x Siemens Gamesa SG128-4.5MW  
Output: 75GWh
- I** The location for the substation construction indicated is seen as highly suitable due to the vicinity of 132kV OHL and 400kV OHL to which it can be connected (depending on decision to connect to distribution – 132kV or transmission- 400kV system).

Space for construction of both options is sufficient, subject to localised earthworks and visual screening. High level cost estimate for the 400kV substation (as informed by NG) would be in line of 10 - 15 mil. GBP, the estimated cost for the 132kV substation will be in line 7 – 10 mil. GBP.

National Grid informed us on pre-Application discussion that their Long Term Development plan sees construction of a new 400kV GSP in the GCRE area and they were interested to hear whether GCRE would provide the land. This case leaves the door open for discussion with NG for their finance of GSP construction with connection provision to GCRE.

**INDICATIVE TOTAL ENERGY OPPORTUNITY:**

- Solar: 24 to 32GWh
- ✦ Wind: 75GWh
- Battery: 1,225 to 1,725MW/MWh
- Hydrogen: 700MWe of electrolyser installed capacity

Total energy related footprint: 85 hectares  
- not including substation





# What GCRE will offer:

- **Three core services**
  - **Rolling Stock Testing**
  - **Infrastructure Testing**
  - **Storage and Maintenance**
- **A site where technologies can be tested, demonstrated and certified for safe use on the UK and international railway in a safe, offline, but realistic environment**
- **Focus on R&D with collaboration between Academia & Industry**
- **The UK's first Net Zero railway**
- **Open Access**
- **With approvals to operate 24/7**



# Masterplan:

**We want GCRE site to be a place ‘where people and ideas come together’, so its vital the design of the site encourages those vital connections and networks. Masterplan for site creates three Campus areas:**

## **BASECAMP**

**For engineers and operators, it will be home, at our hotel, also space for integrated community facilities**

## **CWM MAWR CAMPUS**

**Space where world class R&D and value creation happens**

## **WASHERY CAMPUS**

**The place for the orange jackets, where practical realisation of ideas gets operationalised and tested.**





**Basecamp** ← ↻ →

Seven Sisters

Loops  
Landscape

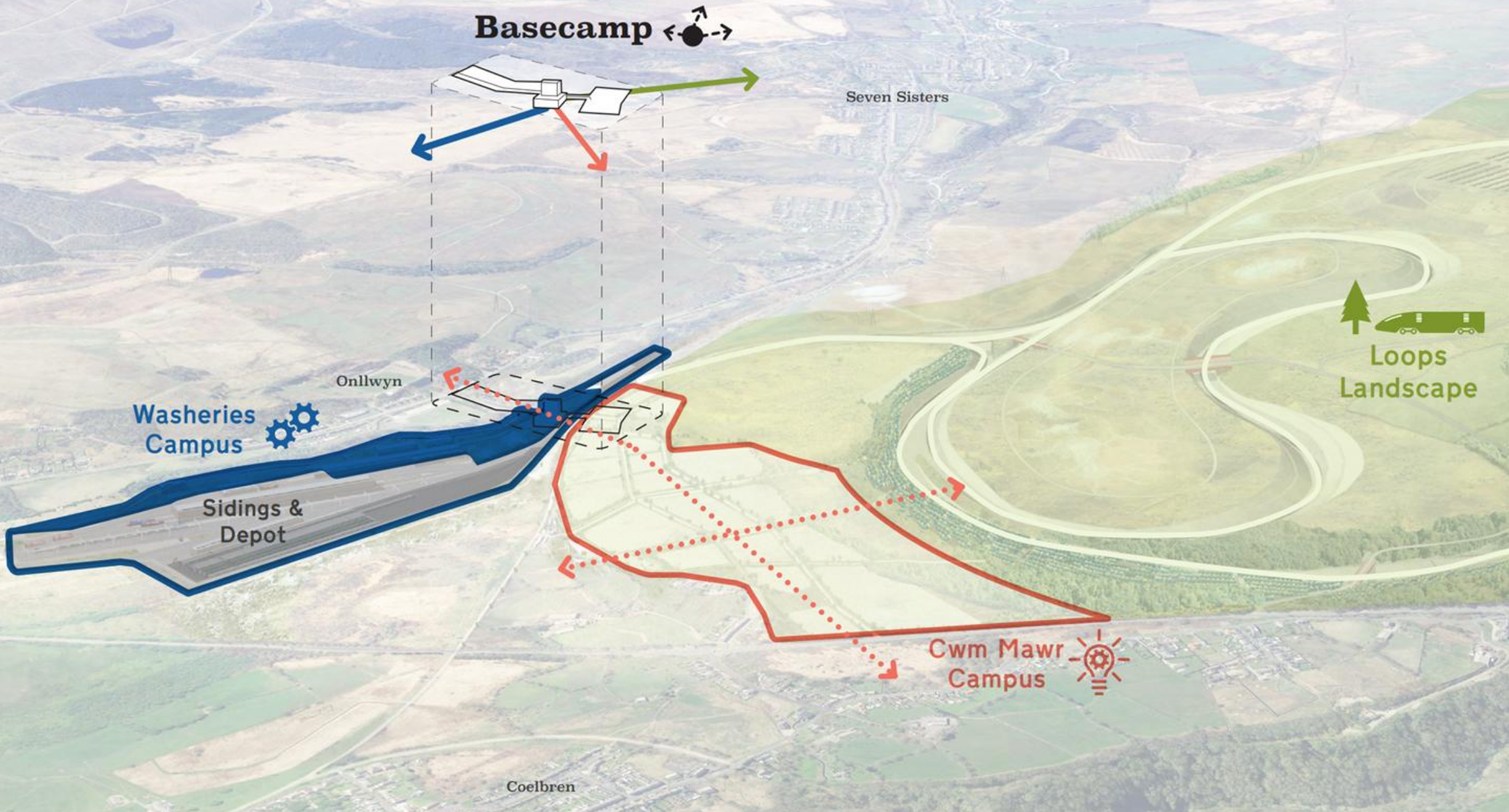
Washeries  
Campus

Onllwyn

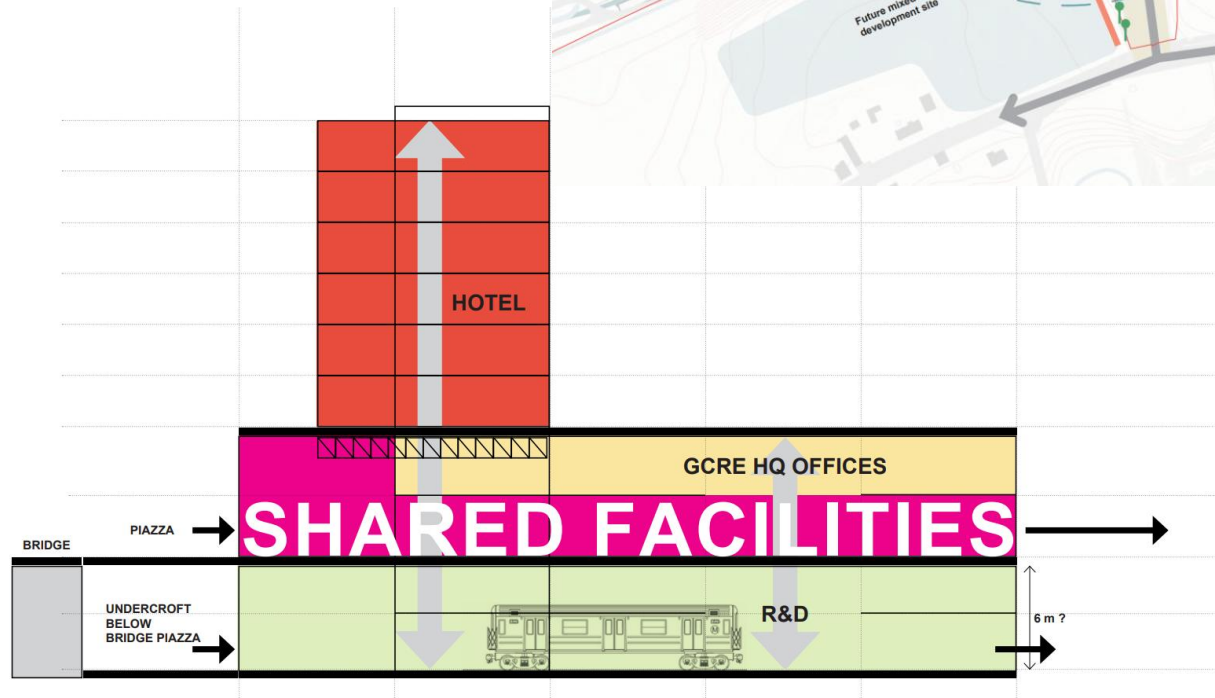
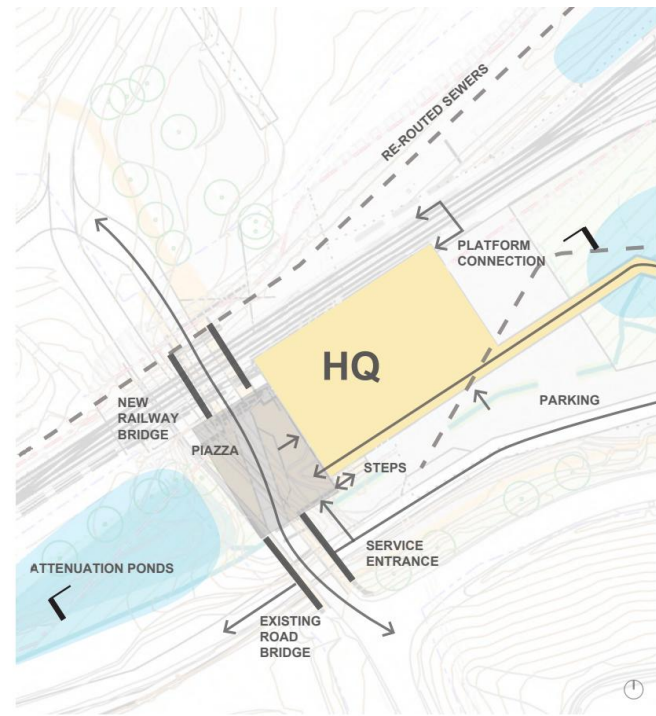
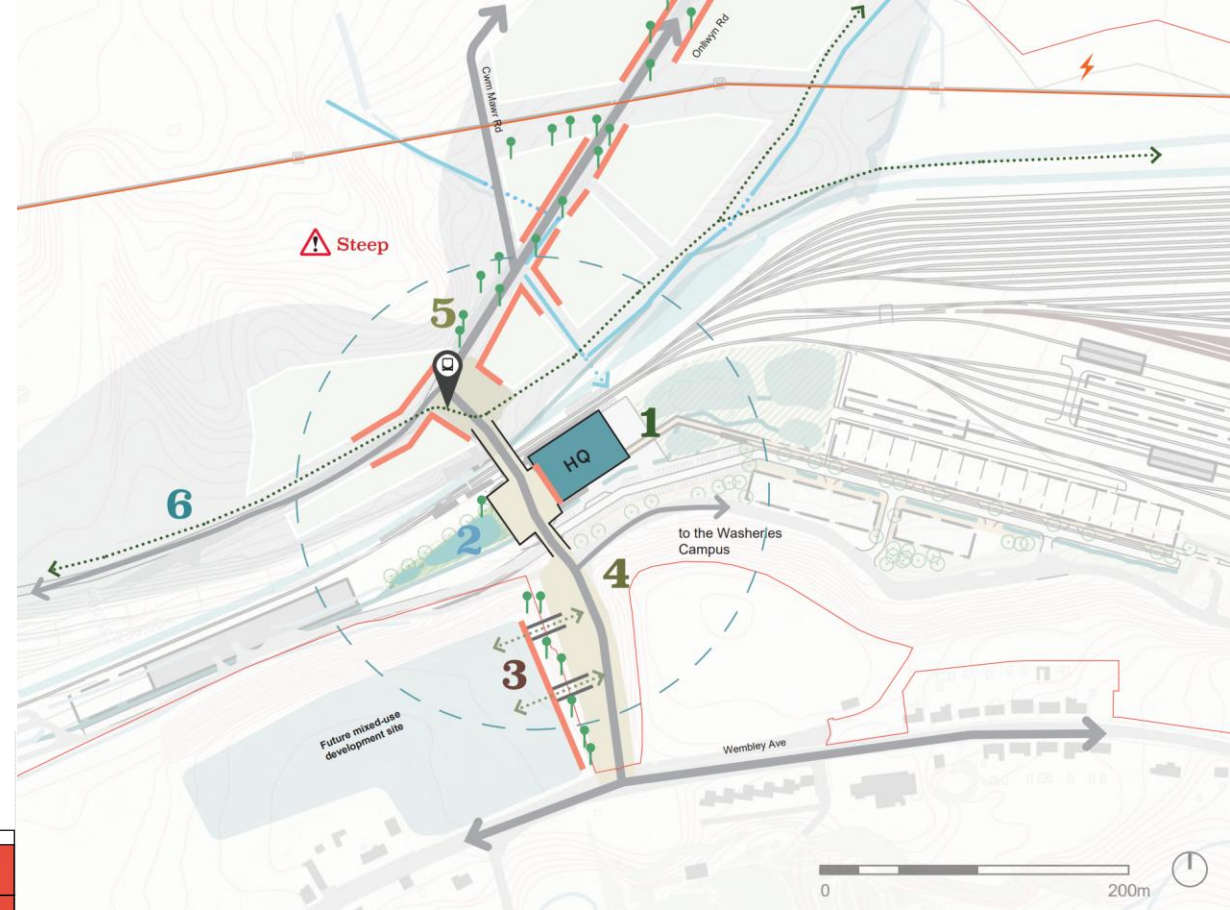
Sidings &  
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Cwm Mawr  
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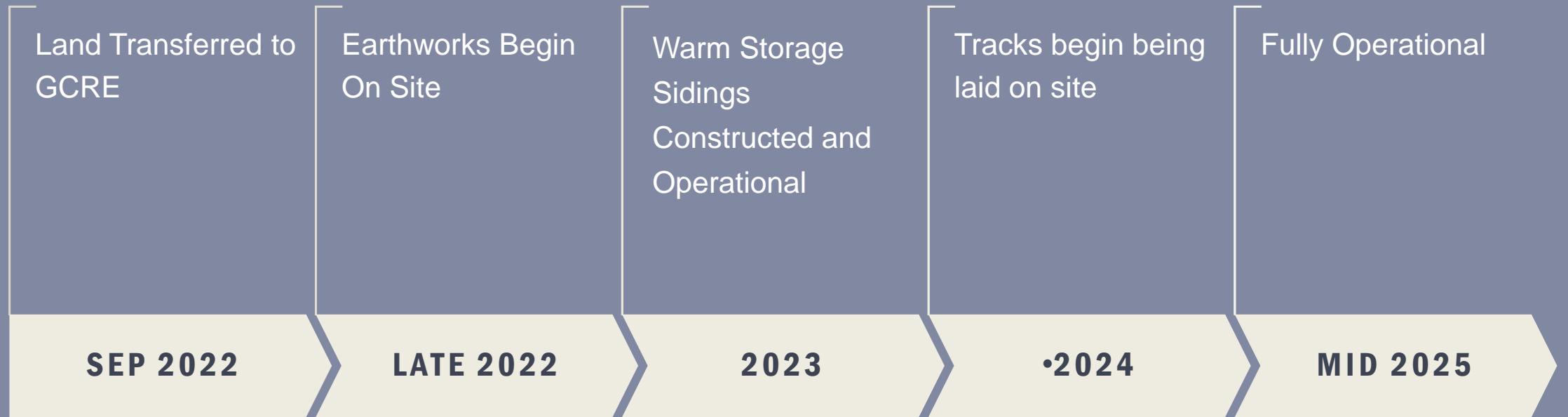








# TIMELINE







# Not Just a Testing Site:

As we grow, chance to explore further opportunities

- **Digital: Embedded sensing and fibre across the site. Autonomous vehicles etc**
- **Energy: Renewable energy generation. Hydrogen and battery innovation**
- **Communications: 5/6G and Spectrum Testing, DRONE 'out of sight' testing**
- **Environmental: Up to half a million native species trees**
- **Commercial: 100 bed hotel on site. Two phase business park and employment site**





# Benefits for Rail Industry and Beyond:

- **Plugs a significant gap in UK rail infrastructure through a unique, world class site for research and innovation**
- **Supporting government in stronger assurance and better cost management of projects and technology**
- **A contributor to the UKs path to Net Zero through a testing ground for innovation**
- **Getting products tested to the highest Technology Readiness Levels (TRL), in a real environment, with no risk to the mainline, will be hugely beneficial to the industry**
- **‘Magnet Project’ that draws in other, high-quality investments. Fits government policy agendas – ‘Levelling Up’ (UK Gov) ‘Fairer, Greener, Stronger’ (Welsh Gov)**





# Seeking Private Investment

- **£70m support from public sector**
  - **Welsh Government (£50m equity investment)**
  - **UK Government (£20m grant)**
  - **Innovate funding (£7.4m)**
- **Full phases of Masterplan – business park etc - £400m**
- **Public procurement launched January 23 to seek equity from the private sector**
- **Process will conclude in autumn 2023 when GCRE will move to majority private ownership**



# Supply Chain Opportunities



- **Catalogue with priced services**
- **Membership scheme offering commercial benefits and access priority**
- **Early adopter benefits for users signed up pre-opening**
- **Demonstrator opportunities**
- **Range of opportunities for supply of materials and services – Sell2Wales**
- **Service Partner opportunities**
- **Infrastructure workshop with Rail Forum April -@ UKKRIN Birmingham**
- **Come and work with us**



# Questions & Thank you

**Website:** [gcre.wales](http://gcre.wales)

**Twitter:** [@GCREInnovation twitter.com/GCREInnovation](https://twitter.com/GCREInnovation)

**YouTube:** [@gcreinnovation youtube.com/@gcreinnovation](https://youtube.com/@gcreinnovation)

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