



REMIX

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European Union
European Regional
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University of Exeter,
Camborne School of Mines

WELCOME

Kip Jeffrey (Head of CSM)



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Introduction to Cornwall

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Cornwall – a county in England

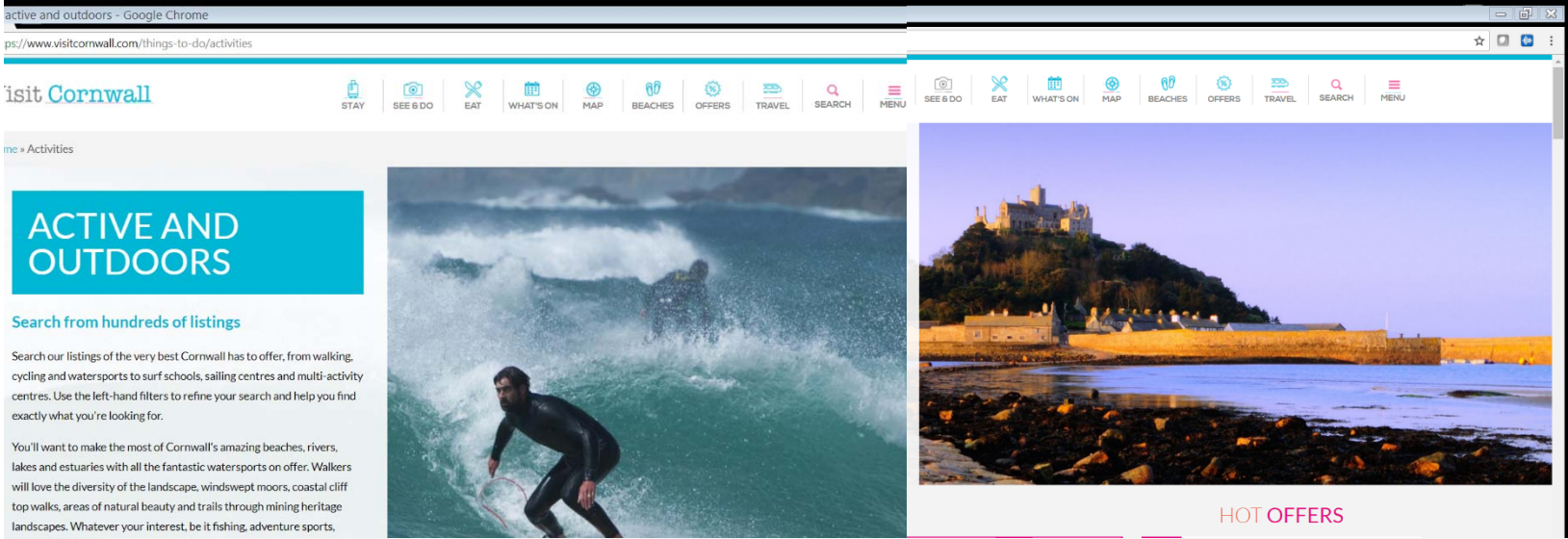


Regional authority:
Cornwall Council

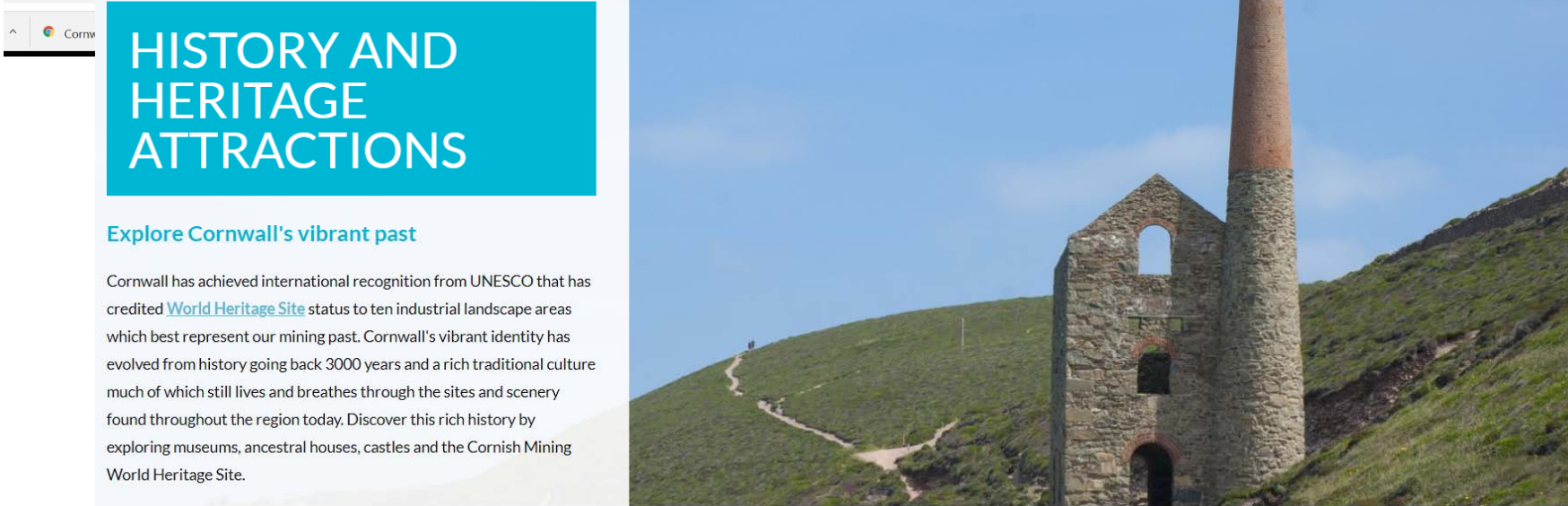
Economic strategy
driven by:
Cornwall and Isles of Scilly
Local Enterprise Partnership

REMIX partner:
Camborne School of Mines,
University of Exeter

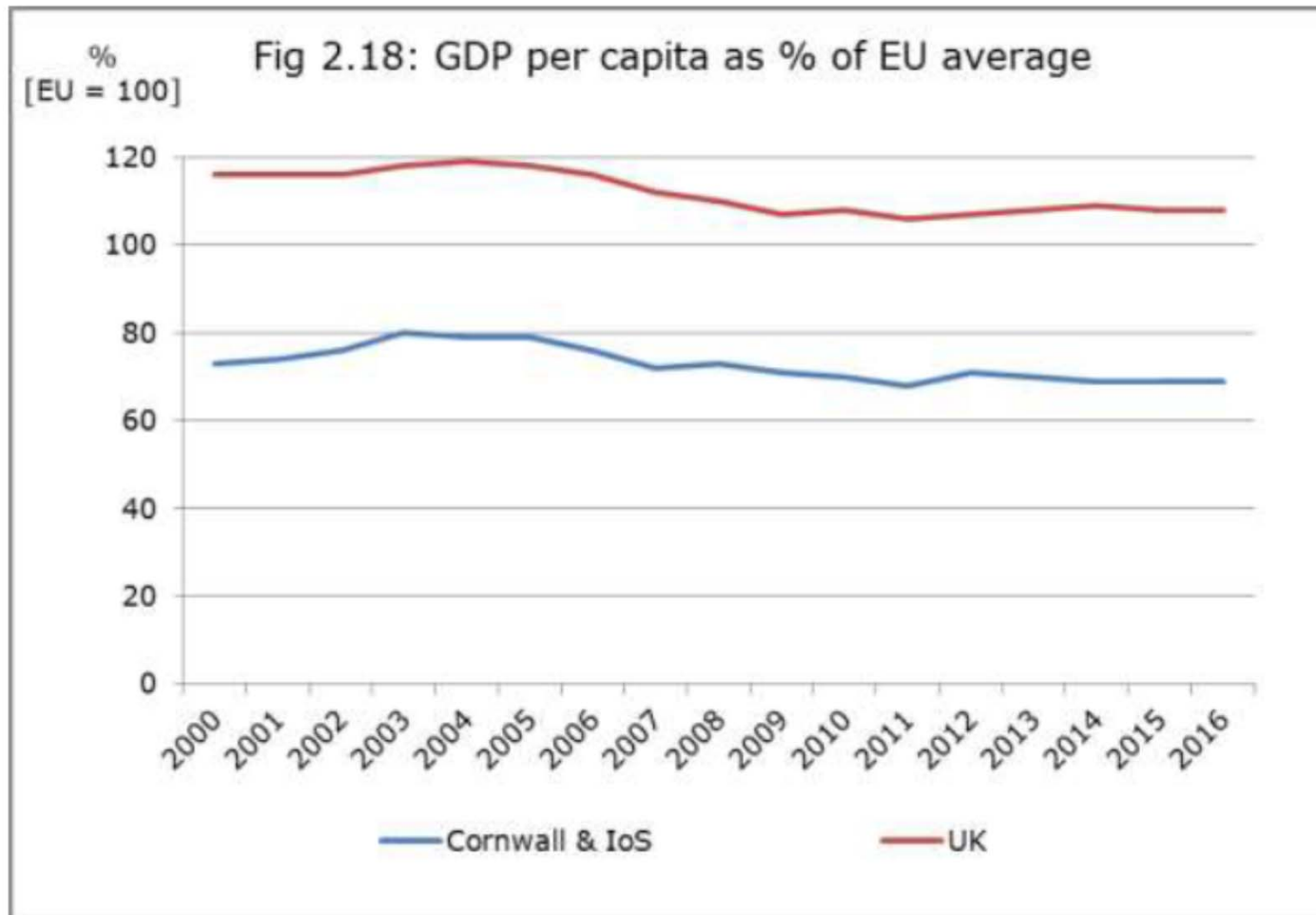
Image of Cornwall?



127 Results



But Cornwall is a 'poor' region in Europe



In 2000, Cornwall and the Isles of Scilly was ranked joint 194 out of 265 NUTS regions; in 2016 it was ranked joint 204 out of 265 NUTS 2 regions.

More stats at: <https://www.cornwall.gov.uk/council-and-democracy/data-and-research/national-sources-of-data/>

Cornwall - Post-Mining



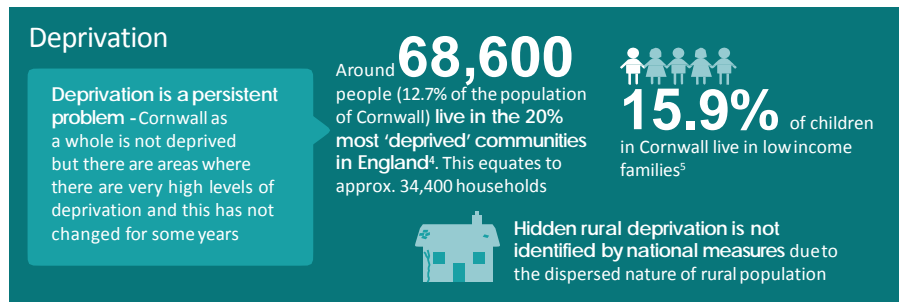
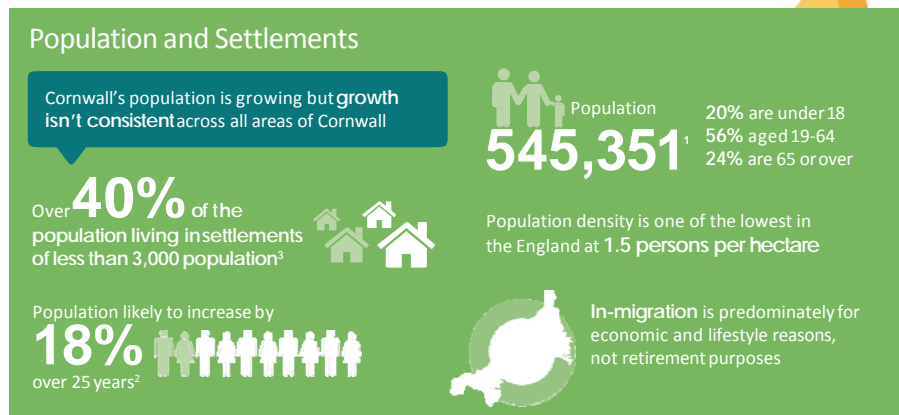
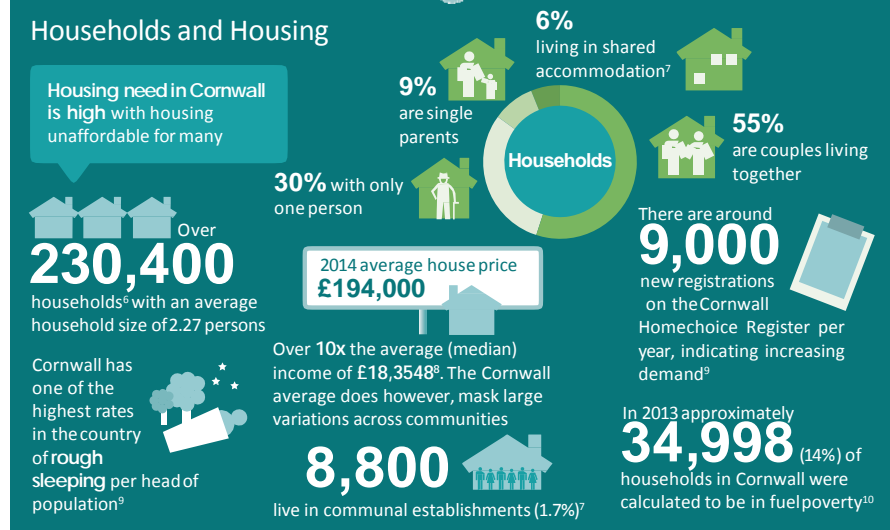
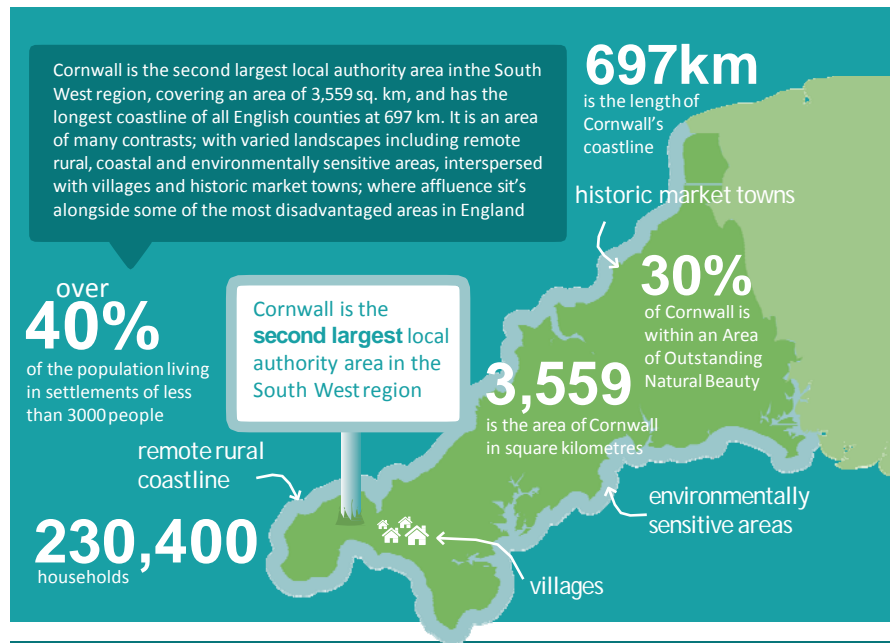
Camborne-Redruth mining district c. 1900

Hundreds of tin (and previously copper) mines have reduced to *none* today.
There was little/no investment in alternative industries at the time of the main reduction in mining

Cornwall today

- Economically, Cornwall is still heavily dependent on agriculture and tourism as the two main sectors.
- Tourism reportedly contributes about 24 % of Cornwall's Gross Domestic Product (GDP), supporting around one in five jobs.
- Connectivity and the installation of superfast broadband has helped Cornwall develop over the past five years. Cornwall has a growing number of digital technology businesses, with growth in this area being one of the highest rates in the country.
- <https://www.cornwall.gov.uk/business/economic-development/economic-intelligence/>

Cornwall: a brief description (2015)...



Cornwall: a brief description (2015)...

Environment

Cornwall's environmental assets are extremely valuable - and are a key contributor to the economy and quality of life

30% of Cornwall is within an Area of Outstanding Natural Beauty

28,000 households have been assessed as at risk from flooding

Cornwall has the **largest** World Heritage Site in UK

60% of CO₂ emissions

Emissions from housing and transport account for over 60% of CO₂ emissions¹² – 33% is from domestic fuel consumption (electricity, gas and other fuels) and over a quarter (29%) by transport

Cornwall has a diverse maritime environment and has a number of nature and landscape conservation area designations

Crime and Disorder

Crime in Cornwall is generally low and is a safe place in which to live and work – despite rises in some areas, crime in Cornwall continues to be low, although fear of crime remains an issue

Cornwall experiences seasonal fluctuations in crime with more offences in the summer months and fewer in winter¹⁷

Violence (including Domestic Abuse crimes) and Sexual Offences are higher than other similar areas and increasing. Consequences of these crimes are far-reaching and long-lasting¹⁷

Overall **16%** of crime is recorded as alcohol related¹⁷

5,600x 999 Each year the fire and rescue service respond to more than 5,600 emergency calls¹⁸

1,309 In 2014 there were road traffic injury collisions in Cornwall¹⁹

Transport

Cornwall's geographical shape and position make infrastructure delivery challenging – Dispersed and sparsely populated settlement pattern combined with Cornwall's coastline present issues of accessibility and challenges for equal provision of services

Car ownership in Cornwall is not a sign of wealth – **high proportions of car ownership** reflects Cornwall's rural nature where conventional public transport is often not viable.

17.3% of households do not have access to a car⁷

Over **68%** of cars in Cornwall are over 6 years old²⁰ reflecting the fact that for many the car is an expensive necessity rather than a luxury.

64% of people in employment travel to work by car

3% use public transport⁷

Labour Market and Economy

Strengthening Cornwall's economy is an ongoing challenge – low economic output (per capita), low wages, low productivity, a lack of big companies have been persistent challenges

33% with NVQ4 and above

Cornwall has low numbers of people without qualifications¹³ (6%), and low numbers (but growing) with high level qualifications¹³. There are also high levels of part-time employment¹⁴ (31%)

13.3% of residents aged 16 to 64 (43,110 people) were claiming key out of work benefits compared to 12.1% in England and 10.9% in the South West¹⁵

Businesses in Cornwall are, on average, **smaller in terms of employee numbers** than the national average.

13.3%

97% of our businesses were small or micro level, employing less than ten people in 2015¹⁶

23% 23% in employment are self-employed; above the national average (14%)¹³

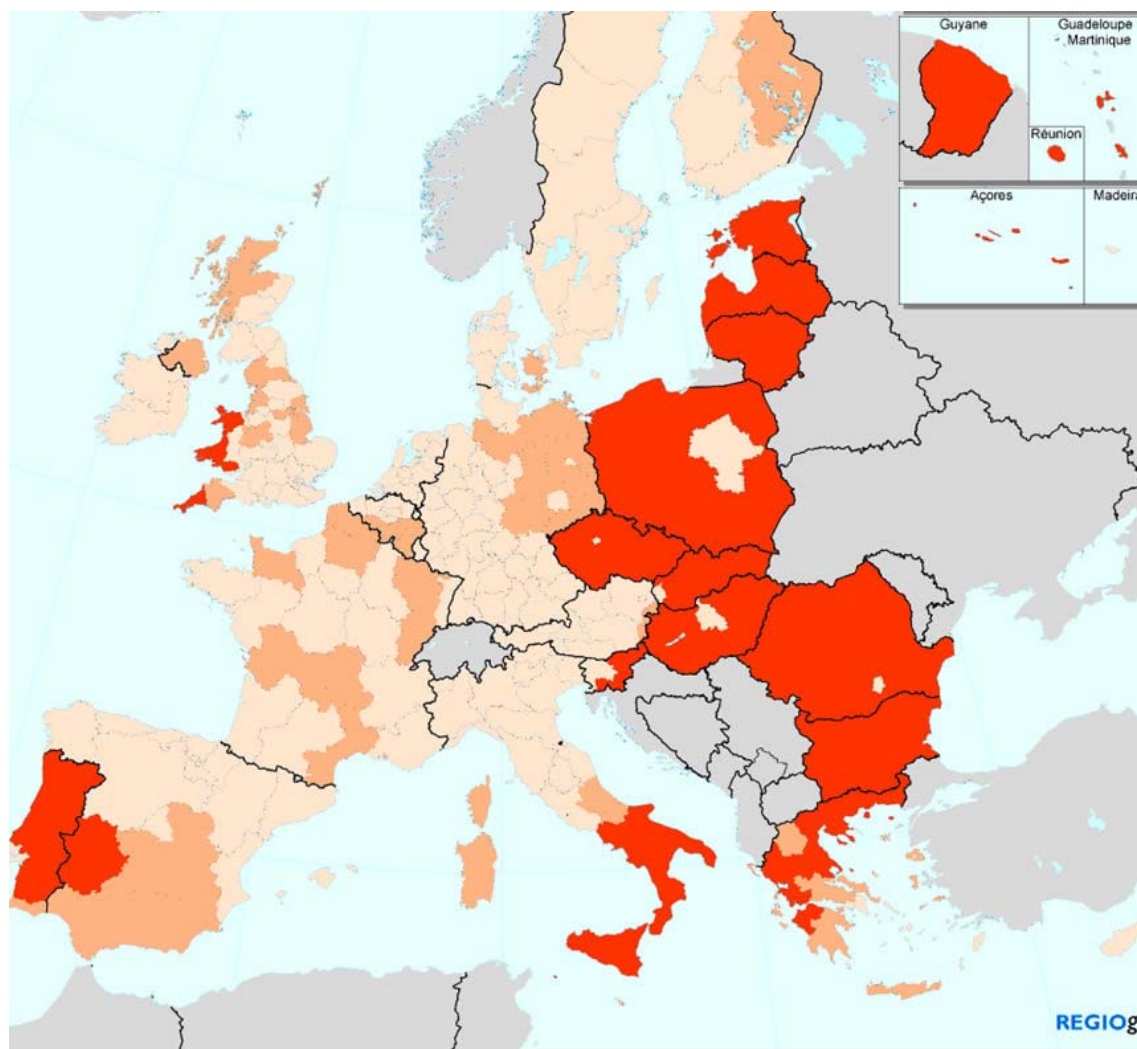
References

1. 2014 Mid Year Population Estimates, ONS, 2. 2014 based population projections, ONS, 3. Mid-2014 Population Estimates for Census Output Areas, ONS, 4. Indices of Multiple Deprivation 2015, DCLG, 5. Personal tax credits: Children in low-income families' local measure: 2013 snapshot as at 31 August 2013, HMRC, 6. Council Tax Database, Cornwall Council, Sept 2015, 7. 2011 Census, ONS, 8. Housing Statistics Portal, Housing Summary Measures, 5 Aug 2015, ONS, 9. Cornwall Strategic Housing Framework, Evidence base, 06 March 2014, 10. 2013 sub-regional fuel poverty data: low income high costs indicator, DECC, 11. Local Alcohol Profiles for England, PHE, June 2015, 12. UK local authority and regional carbon dioxide emissions national statistics: 2005-2013, DECC, 13. ONS Annual Population Survey, Jan 2014- Dec 2014, 14. ONS Annual Population Survey, Jan 2014- Dec 2014, 15. Benefit claimants - working age client group, February 2015, ONS Crown Copyright Reserved [from Nomis on 21 October 2015], 16. Inter Departmental Business Register (ONS), UK Business Counts 2015, workplaces, 17. Safer Cornwall Strategic Assessment, 18. Cornwall Fire and Rescue Service, Risk Based Evidence Profile, 2014, 19. Road Safety – Accidents 2014, DfT, 20. Vehicles licensed by body type in Cornwall Unitary Authority as at 30 June 2015, DfT

Further details
Further statistical profiles of areas across Cornwall are available via our website. To access these please go to: <http://www.cornwall.gov.uk/jsna>



2014-2020 Less Developed region



- 64% EU average (2011)
- C.€590m ERDF & ESF
- Peripheral location
- Sparsely populated
- Declining heavy industry
- Ageing population

How much investment has Cornwall & the Isles of Scilly received?

Objective One 2000-2006

Objective One value without match= £350m

Objective One value with UK public sector match = £700m

Objective One + public sector match + private sector match= £900m

Convergence 2007-2014

ERDF Convergence value without match = €458m

ERDF Convergence + match = £950m approx. (from ERDF legacy calculations)

ESF Convergence value = £164m

ESF Convergence + match = £222.4m (from ESF evaluation)

Growth Programme 2014 - 2020

Cornwall & Isles of Scilly Growth Programme value ERDF = £340m

Cornwall & Isles of Scilly Growth Programme value ESF = £130m

Total = £2.5 BILLION

Our REMIX Policy Instrument: Cornwall and Isles of Scilly Local Enterprise Partnership European Structural and Investment Fund Strategy



The SIF strategy contains three main areas of activity :

‘Future Economy’ which concerns investment to capitalise on regional strengths and characteristics to exploit new and emerging markets, including **smart specialisations**;

‘Growth for Business’ to accelerate business productivity and competitiveness and

‘Conditions for Growth’ to overcome blocks to growth, improve infrastructure and increase human potential. Future economy includes

(1) smart specialisations of Agritech, Digital Economy, EHealth, Marine technology, and Space and aerospace assets and

(2) Activities with growth potential that develop Cornwall and the Isles of Scilly as a ‘green and marine’ region.

The policy recognises that almost all businesses in the region (99.8%) are micro, small and medium sized enterprises and therefore this sector is the key driver of growth and employment. The proportion of micro enterprises is high (87.7%). Also recognised is the challenge of how much lower research and innovation investment in Cornwall and Isles of Scilly than the average elsewhere in the UK.

In REMIX, University of Exeter aims to:



- Enhance implementation of the Digital Economy smart specialisation by recommending how to enable new projects in the mining related sector. New expertise, links to academic research, case studies, and access to high performance computing are required so that the SME sector can take part in using 'Bigdata'.
- Engage with innovation and best practice in environmental protection and resource efficiency (thematic objective 6) - a topic directly relevant not only to mining companies but to a significant international consultancy sector in Cornwall. Relevant topics include state of the art environmental and social impact assessment, environmental remediation and protection, mining with no surface footprint, improvements and innovation in minerals processing and how best to integrate renewable energy sources into mining operations.
- Enhance the SME sector, e.g. via the Cornwall Mining Alliance, through a better understanding of how the sector can collaborate to boost individual businesses, using examples of good practice
- Make policy proposals for consideration in post 2020 regional policy instruments.

Proposed self-defined performance indicator:

- Engagement of 30 local companies with activities
- Policy and best practice recommendations Cornwall Council for current policy instrument to prepare post 2020 regional policy

Provisional questions for the Cornwall peer review

- Enhance implementation of the Digital Economy smart specialisation

Question - How can mining-related businesses benefit from the digital economy?

- Engage with innovation and best practice in environmental protection and resource efficiency (thematic objective 6)

Question - What are the next innovations for environmental and social mining-related businesses?

- Enhance the SME sector, e.g. via the Cornwall Mining Alliance, through a better understanding of how the sector can collaborate to boost individual businesses, using examples of good practice

Question - How can SMEs collaborate to tackle large contracts?

- Make policy proposals for consideration in post 2020 regional policy instruments.

Question - What are the big initiatives that Cornwall should take to expand mining related businesses?

Other (newer) policy documents:- Local enterprise partnership vision 2030



<https://www.cioslep.com/vision/vision-2030> (2017)

By 2030 Cornwall and Isles of Scilly will be the place where business thrives and people enjoy an outstanding quality of life."

To achieve this, the plan outlines three objectives:

Business: achieve thriving businesses which excel at what they do

People: achieve inclusive growth and improve the skills of our workforce

Place: improve infrastructure and economic distinctiveness

Strategic drivers:

Innovation and creativity

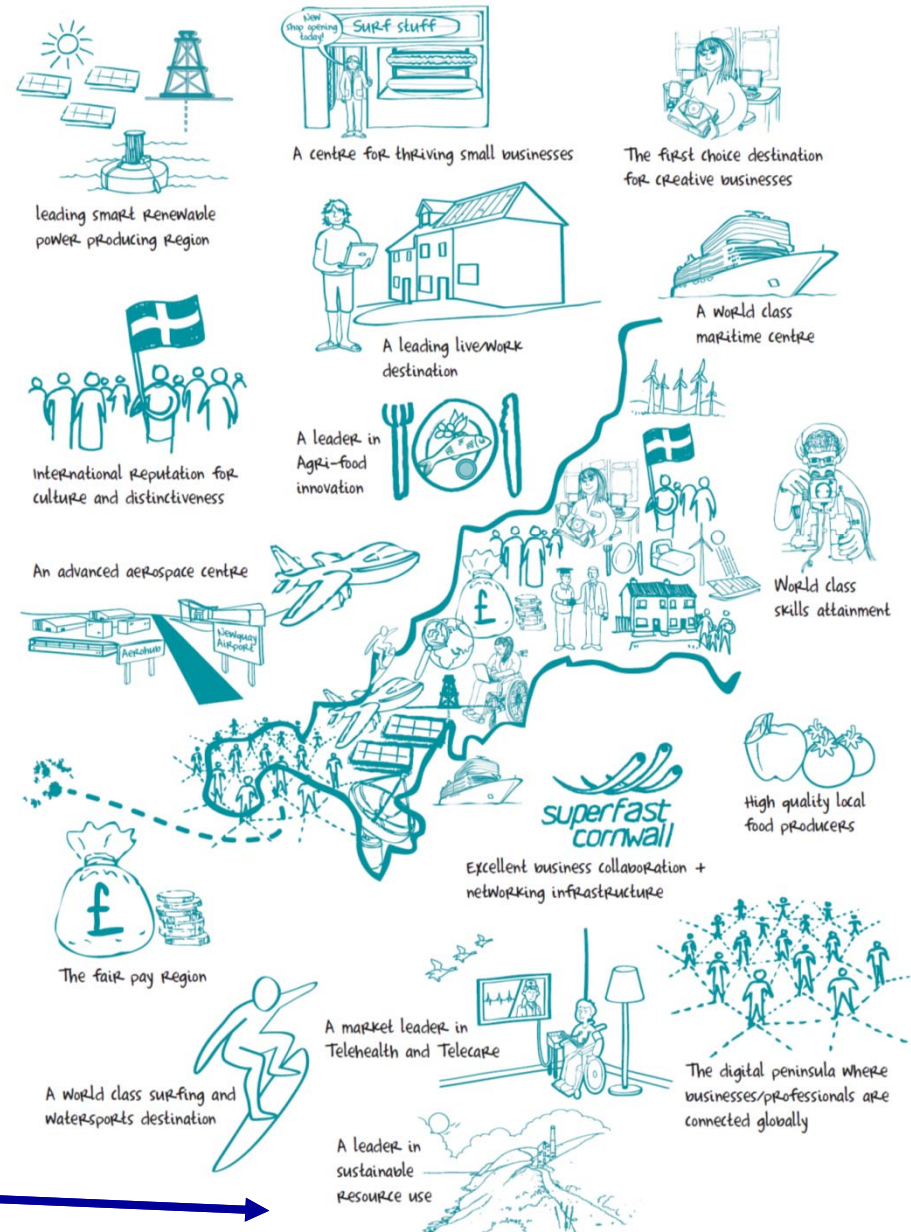
Productivity led growth

(No mention of mining)

Cornwall Council Economy and Culture strategy 2012 - 2020

A 2050 vision for Cornwall

This strategy refresh follows the 2010 Cornwall Council Economic White Paper, it endorses the current direction of travel for our economic interventions which set out to improve the lives and fortunes of the people of Cornwall. But what of Cornwall's long term future? Where will our interventions take us?



Slightly older overview document – and here we are:

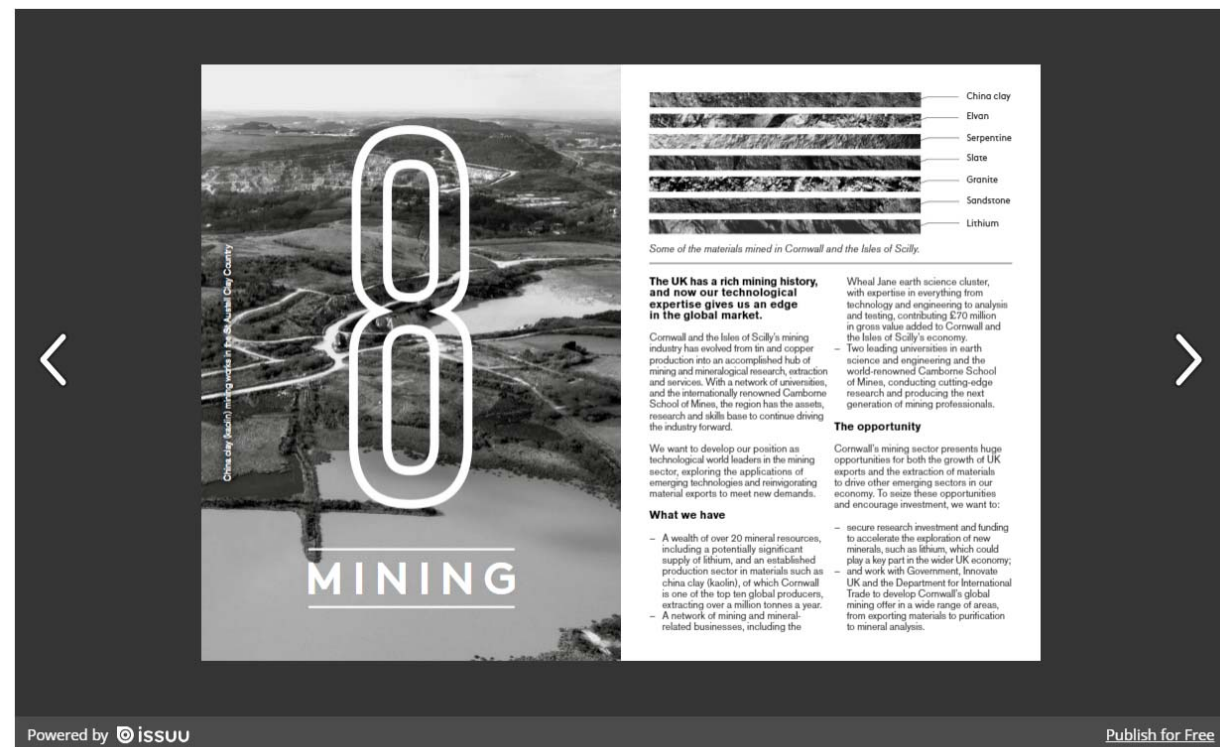
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New Local Enterprise Partnership document, 2018 – 10 opportunities

<https://www.cioslep.com/vision/10-opportunities>

- 1 Creative
- 2 Space
- 3 Energy
- 4 Food
- 5 Agri-tech
- 6 Tourism
- 7 Marine
- 8 **MINING**
- 9 Aerospace
- 10 eHealth



China clay (kaolin) mining works in the St Austell Bay Country

Some of the materials mined in Cornwall and the Isles of Scilly:

- China clay
- Elvan
- Serpentine
- Slate
- Granite
- Sandstone
- Lithium

The UK has a rich mining history, and now our technological expertise gives us an edge in the global market.

Cornwall and the Isles of Scilly's mining industry has evolved from tin and copper production into an accomplished hub of mining and mineralogical research, extraction and services. With a network of universities, and the internationally renowned Camborne School of Mines, the region has the assets, research and skills base to continue driving the industry forward.

We want to develop our position as technological world leaders in the mining sector, exploring the applications of emerging technologies and reinvigorating material exports to meet new demands.

What we have

- A wealth of over 20 mineral resources, including a potentially significant supply of lithium, and an established production sector in materials such as china clay (kaolin), of which Cornwall is one of the top ten global producers, extracting over a million tonnes a year.
- A network of mining and mineral-related businesses, including the


Wheal Jane earth science cluster, with expertise in everything from technology and engineering to analysis and testing, contributing £70 million in gross value added to Cornwall and the Isles of Scilly's economy.

- Two leading universities in earth science and engineering and the world renowned Camborne School of Mines, conducting cutting-edge research and producing the next generation of mining professionals.

The opportunity

Cornwall's mining sector presents huge opportunities for both the growth of UK exports and the extraction of materials to drive other emerging sectors in our economy. To seize these opportunities and encourage investment, we want to:

- secure research investment and funding to accelerate the exploration of new minerals, such as lithium, which could play a key part in the wider UK economy;
- and work with Government, Innovate UK and the Department for International Trade to develop Cornwall's global mining offer in a wide range of areas, from exporting materials to purification to mineral analysis.

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*** Mining is on the agenda ***

Future funding for Cornwall post Brexit



- **UK Shared Prosperity Fund** (scheme to replace EU support)
- **UK industrial strategy challenge fund**
- ***Potential/probable* participation in future EU R&I and C&S actions, and others?**

UK - national mining

- There is no national 'mining ministry' in the UK. Mining is related to the Department for Business, Energy and Industrial Strategy, Department for Environment, Food and Rural Affairs, including for permitting. Ministry of Housing, Communities and local Government. Local planning authorities, such as Cornwall Council are important.
- A UK minerals strategy will be launched on 10 July 2018 – by the Mineral Products Association and CBI (Confederation of British Industry) Minerals Group. This is an industry-led initiative, mainly by the aggregates industry.
- There are other new mines in development, including Sirius Minerals Woodsmith potash Mine that has planning permission to operate in a national park.
- Drakelands tungsten mine (World's 4th largest deposit) operated by Wolf Minerals was the first new metals mine in the UK for over 40 years when it opened in September 2015 just over the border from Cornwall in west Devon.

Current mining in Cornwall

- World class china clay mines operated by Imerys in the St Austell area, 900 employees, 100 in R&I
 - > 20 active sites across Cornwall
 - Million tonnes of china clay (kaolin) per year
 - Top ten global producer of china clay
- <https://cornwallminingalliance.org/imerys-minerals-ltd/>



Exploration/development projects

- Re-opening South Crofty tin mine (Strongbow)
- Redmoor tin-tungsten exploration (New Age Resources)
- Lithium in brines in granite (Cornish Lithium)
- Reprocessing of waste on mica dams associated with China clay mines to recover lithium (Imerys)
- Tellus South West geophysical and geochemical survey.

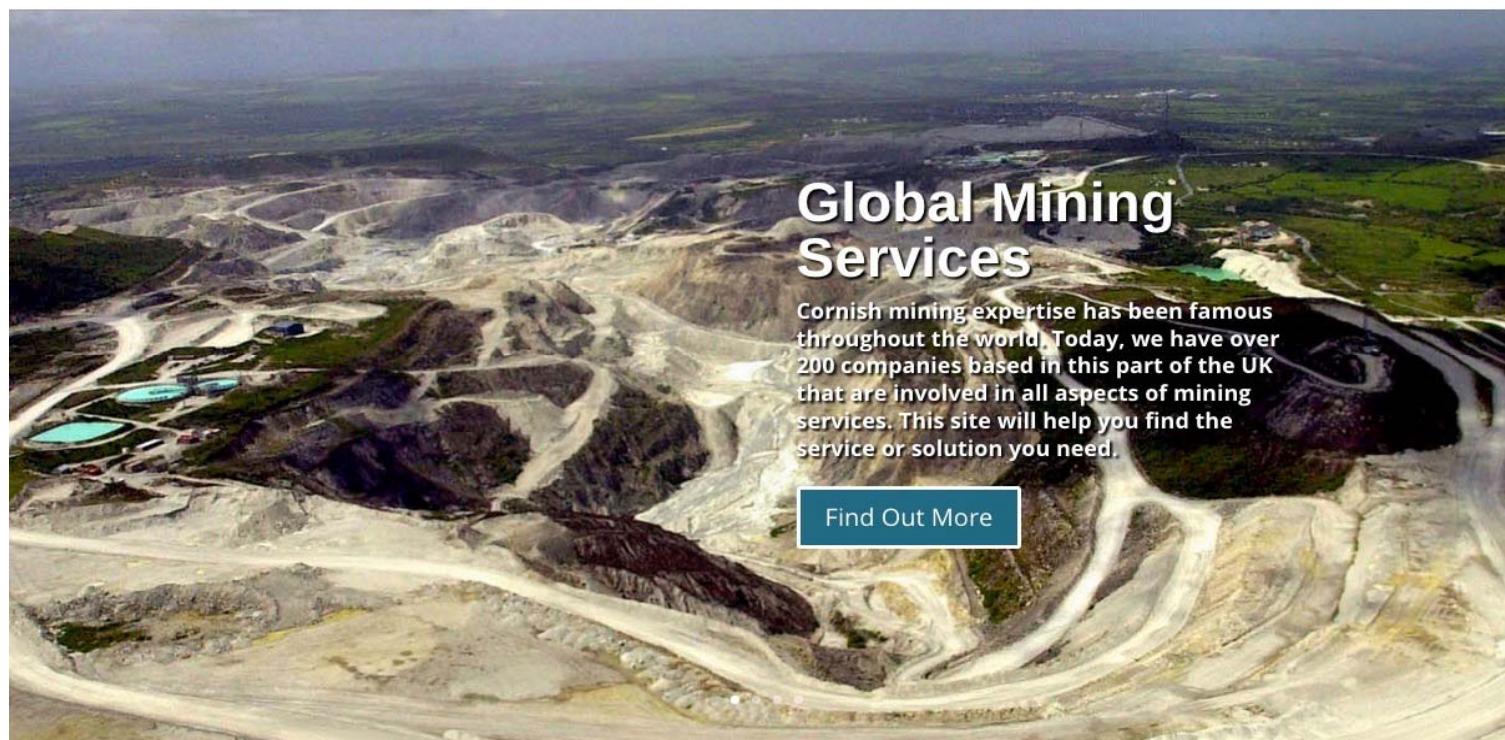


Cornwall Mining Alliance

01872 560200 hello@cornwallminingalliance.org



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Global Mining Services

Cornish mining expertise has been famous throughout the world. Today, we have over 200 companies based in this part of the UK that are involved in all aspects of mining services. This site will help you find the service or solution you need.

[Find Out More](#)

Discover innovative services & expertise for global mining industries

SMEs



- Cornwall has a unique concentration of innovative businesses, organisations & experienced professionals providing services to mining & related industries in the UK & around the world.
- Aim: to enable specialist mining related SMEs to collaborate on and access large domestic projects & global export opportunities
- Created by the Cornish Chamber of Mines & Minerals in response to UK Government initiative
- DIT identified High Value Opportunities in global mining sector
- Initial funding from the Chamber & CSM, University of Exeter
- Directory of professionals in Mining & Minerals Sector in South West
- Organisations categorised by service sector (12)
- Preferred communication channel for DIT
- Run & managed by volunteer steering committee
- 89 members.....and growing!

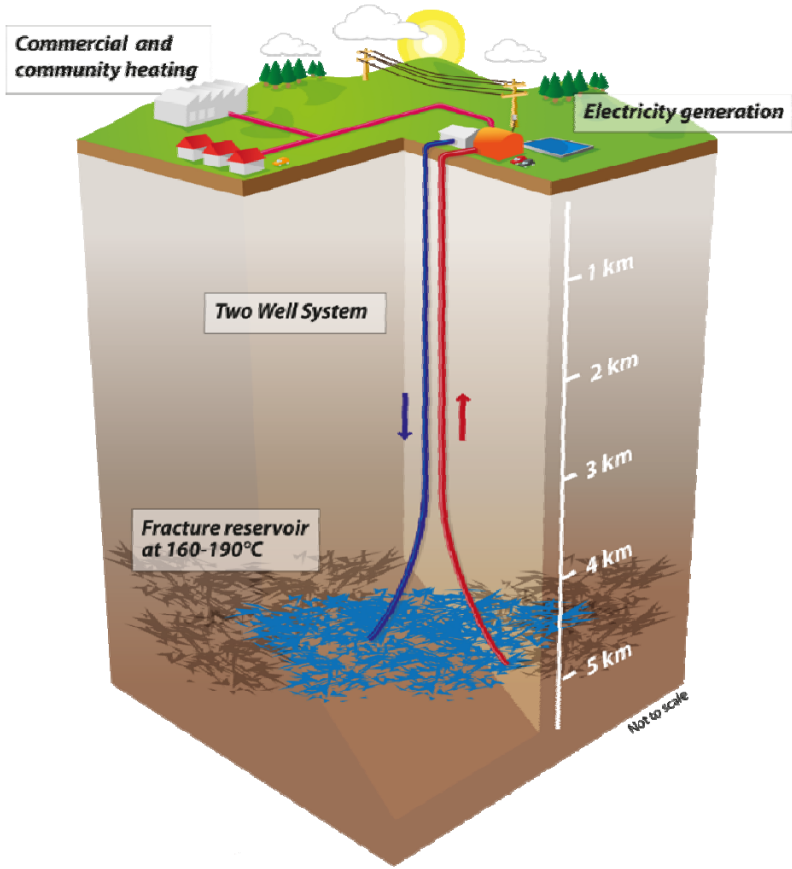
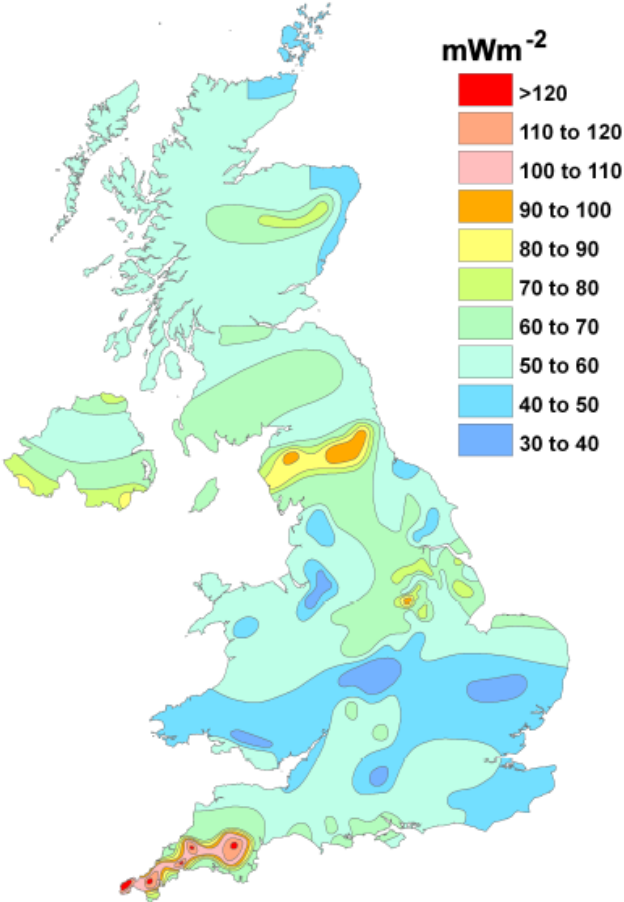
Cornwall Mining Alliance



Companies operate in the following areas within the CMA:

- Geological
- Mineral processing
- Mining engineering and surveying
- Environmental and social
- Energy
- Software and digital
- Analysis and testing
- Research and training
- Contractors and supply chain
- Professional support services
- Mines and quarries
- Mining heritage

Deep Geothermal Energy



© EGS Energy Limited 2009-13

Eden Project

“Eden’s mission is to explore our dependence on the natural world, to use that understanding to excite people into delivering transformation where they live and to ask really serious questions about what a great future might look like for all of us.”

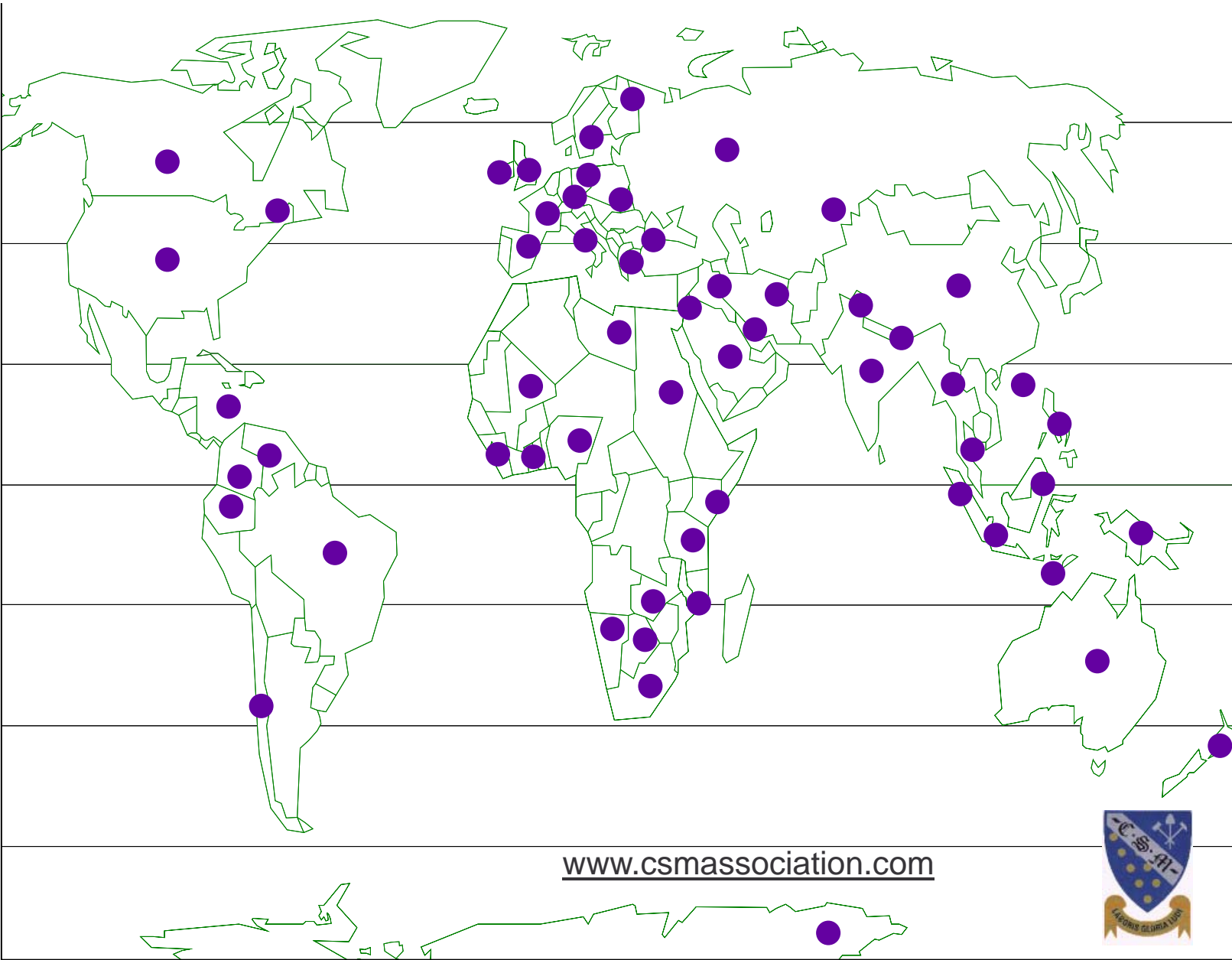
Tim Smit



Higher Education

- Universities Exeter (full service uni.) & Falmouth (arts and media) on Penryn Campus contributed £491 million to economy of Cornwall and IoS between 2002 & 2012. (Penryn Campus is an EU investment)
- University of Plymouth also in Cornwall. Cornwall College, Truro College offer further and higher education
- Camborne School of Mines is one of the University of Exeter departments on the Penryn Campus. 33 academic staff, 15 research staff, ca. 400 UG, PGT, PGR students, Started 1888 alongside the mines, now UK's multidisciplinary mining school – mining, processing, geology, environmental, social.
- Also Business, Biosciences, Renewable Energy, Maths, Geography, English, History, Politics on Penryn Campus

CSM Association alumni network



Camborne School of Mines degree programmes



Post graduate research

PhD/ MSc by Research

Post graduate taught

- MSc Mining Engineering, MSc Minerals Processing
- MSc Applied Geotechnics, MSc Tunneling
- MSc Mining Geology, MSc Exploration Geology
- MSc Surveying and Land/Environmental Management
- MSc Mining Professional (blended learning)

Mining Engineering (accredited by IOM³)

- BEng/MEng Mining Engineering

Geology (accredited by The Geological Society)

- BSc/MGeol Applied Geology
- BSc/MGeol Engineering Geology and Geotechnics
- BSc/MGeol Geology

BEng and BSc are full-time three-year programmes of study;

Four year MEng Mining Engineering and MGeol integrated masters programmes introduced from 2014

MSc – one year intensive



CSM Research groups



University of Exeter - Google Chrome

arch/

Active earth



Deep time global change



Minerals engineering



Mining education



Mining, environment and society



Mining, geotechnical and safety engineering



Ore deposits and critical metals



FP7, H2020 projects:

- FAME
- OPTIMORE
- STOICISM
- HITECH ALKCARB
- IMP@CT
- INTRAW
- MIREU

+ Multiple European Research Fund for Coal and Steel Projects

+ UK research council funding

Cornwall Mining World Heritage site

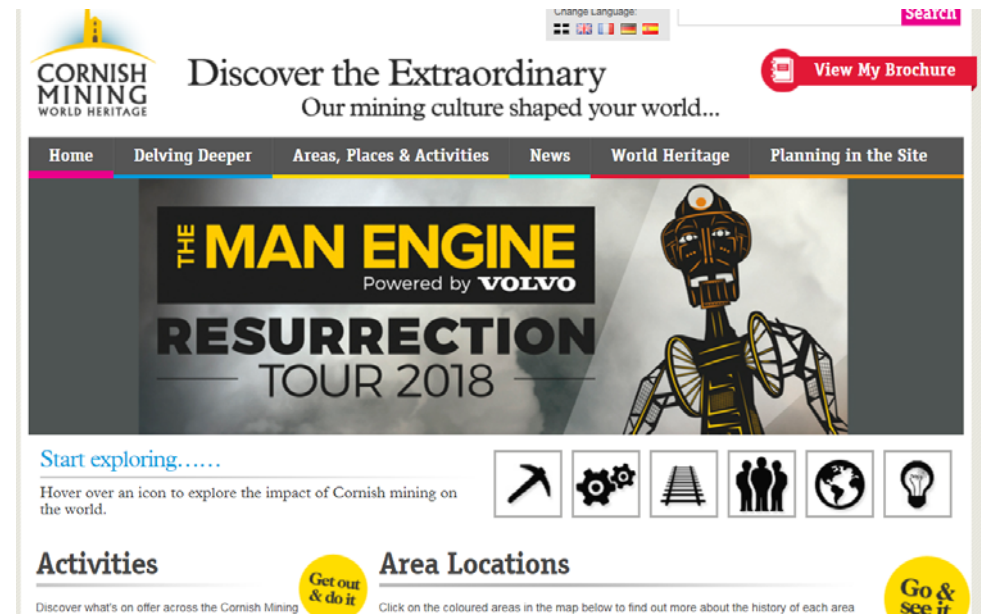
<https://www.cornish-mining.org.uk/>

Well worth watching videos https://youtu.be/uYREWz_qccs

https://www.youtube.com/watch?v=_qydn7Zq5EU

Examples of places in the Mining World Heritage sites:

- [Geevor Mine Museum](#)
- [Heartlands](#)
- [Eden Project](#)



Deep Geothermal Energy

- The deep geothermal resource in Cornwall is an opportunity for renewable heat & power generation and collaboration with mining-related activities
- The 'Hot Dry Rocks' study led by CSM in the 1970-80s confirmed high temperatures in granite
- Potential for significant economic & community benefits
- Expense & uncertainty has prevented further exploration...until now
- ERDF funding (Cornwall and Isles of Scilly growth programme), Cornwall Council & private funds have enabled a project at United Downs near Redruth, led by Geothermal Engineering Ltd
- **Two wells will be drilled in Q2 2018 to depths of 2.5km & 4.5km**
- Local residents have been proactively engaged and PhDs funded on public perception, as well as technical aspects
- Another scheme at Eden Project, led by EGS Energy Ltd, is awaiting the outcome of funding
- Meanwhile, there is excitement about Jubilee Pool, Penzance – a geothermal well is being drilled to heat a seaside swimming pool to 35C!



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Thank you!



Project smedia