

Labs to Riches Speech, Royal Society Speech 28th March 23

Not delivered exactly as per the text & with the parts in [] omitted, but left in as it adds context.

It's an honour to speak at this Royal Society Industry team's flagship event – Labs to Riches

- **Thanks, so much, for inviting me.**
- **Thanks Sue [Dame Sue Ion] for the very kind introduction**

And I do love the theme of this years dinner – celebrating innovation in manufacturing, the topic I have dedicated most of my working life towards.

It's Tremendous to see this gathering of leaders and influencers from Academia, Industry & Government,

And Adrian [Sir Adrian Smith], I am delighted to be one of the 10% you mentioned – the 1/10 events and speeches that take place in this Society on the topic of innovation, industrialisation and scale up, rather than core science.

..... and as well as enjoying our evening together, **I'm going to try and focus the mind a bit on our responsibility.**

I know it's a bit late in the evening for that 😊

But - we do have a massive responsibility – to maximise UK's opportunity from this 4th Industrial Revolution

And to make sure it creates the maximum value for Society.

And what an opportunity that is....to create new green, industries, grow UK manufacturing based on great technologies like Hydrogen, Off-Shore wind etc

One of the great privileges of my time at Siemens, was to regularly visit Hull and see what an impact the off-shore wind revolution that we helped lick-start was having on the region. And I mean the random conversations with people in the streets or a restaurant on how this has created fantastic opportunities for their son, daughter or niece and nephew. Creating these new industries is truly transformational for communities.

And the opportunity to improve our manufacturing using great technologies like Industrial 5G, AI/Machine learning, Additive Manufacturing etc, to raise our productivity.

But the question is - are we doing well enough?

To help me think this through in preparation for this speech, I looked back at some of the speeches with a similar title I gave 10 years ago. I was genuinely upbeat, with all the academic and innovation capability we have, we must be able to do rather well in this revolution,

Having not done a great job of transitioning to the third – where for example, we failed to capture the first wave of industrial PLC's & microprocessors, both in terms of their creation / local manufacturing and in terms of their adoption. We totally failed to transition from some of the older industries to the new, like steel, coal etc

- **Surely, we will do better and be able to accelerate the pace of the adoption of digital technologies** in our industries up and down the country?

- Surely we will do better... because we absolutely have the **capability of leading the transition to a zero-carbon mobility, electric vehicle revolution**
- We absolutely have the capability to lead, as we move to the **next generation of telecoms – 5G and all the possibilities that creates for industry.....**
- Surely, we can **modernise our Railways**, and make them fit for the 4th or even the 5th & 6th Industrial Revolution, and make that affordable for all– after our 1st key railway revolution has lasted three industrial revolutions – **should it outlast the fourth? Surely we can master HS2, and make it get past Old Oak Common?**

So, this talk is for me a bit of a reflection, for me on how well we have done....

- And I can tell from the mood in this room, you agree.....it's not good enough
- Our business investment stays at below pre Referendum & Pandemic levels – The lowest in G7. [We used to enjoy **£8 in £100 global investment came to the UK**, which has dropped to ... **£1.70 in 2023**]
- We are way below par at our pace of adopting Robotics, where we are **not even in the top 15 countries & at 24,000 Robots, that's a tenth of Germany's**
- **We don't adopt energy efficiency technology enough like the super Siemens inverters – the G120X built right here in the UK – and one of the fabulous manufacturing case study as part of tonight's celebration. It's also close to my heart, as it is in this factory that I started my career as an engineer 30+ years ago.**

But I'm an optimistic person, and I know that all us innovators, engineers, academics, industrialist all of us in this room are....

And we know we can do it.....

- The pandemic did accelerate the adoption of Digital Tech
- A group of industrialists from companies – Penlon, Siemens, Airbus, Meggitt, McLaren, HVM Catapult & many more - many in this room, **created the fantastic ventilator challenge – and built 13000 ventilators - using remote digital design & simulation tools, pretty much all of it digitally & remotely. The speed and achievement was quite unbelievable.**
- Luckily, we didn't need them all, as the vaccine saved us, but it showed us what we can do, when the pressure is on,
- The vaccine of course being another example of how, when the pressure is on, we can do it!
- Off-Shore Wind another positive example of how we have become leaders in that industry
- So, we do have some great achievements to celebrate...
- And...we do have some amazing assets.....
- The best Universities & academia in the world – three or four of the top 10 in the world by many measures.
- We have developed our excellent Catapult Network and institutions like Glass Futures – Richard Katz here tonight taking leadership on how to take our glass industry into the net-zero future. Another case study you can read in the great manufacturing stories published for this event tonight.
- We have the largest tech sector in Europe & bundles of entrepreneurialism.

- **Our weakness is, and we know it, that we need to scale many of these activities better** - let me come back to that.

And there is more good news - This 4th Industrial, digital tech revolution will keep throwing new opportunities at us:

- **We haven't done great at maximising UK's opportunities for transitioning to eV's – sadly**
- The EU now has plans for a **Gigafactory capacity of 582GW by 2030**, whilst in the UK we have **6GW for a small battery facility supplying Nissan** & a couple of maybe's – JLR's decision on where to build batteries & more eVs is pending and will be critical to UK's eV manufacturing future.
- **China's capacity, by the way is set to rise to 2000 GWh by 2030.**
- But here the good news, **we have the Hydrogen Fuel Cell eVehicle revolution yet to come**
- That's why I've joined the team at Riversimple – also featured in one of the manufacturing case studies tonight - & you can see the wonderful Rasa car – parked right outside the building tonight!
- **So, let's make sure we own this Hydrogen Fuel Cell Car revolution. It's an amazing opportunity and I'm convinced we can create significant local innovation and manufacturing.**
- We have a whole wave of super computing, quantum, AI yet to come,
- Capabilities of Chat GPT having made the power of that so real.
- And many more opportunities like those in new Nuclear / SMRs, the broader Hydrogen economy etc.
- There is plenty to go at!

What do we need to do to make a better success of these?

- **Well a key theme here is scale, more scale.....**
- **Scaling our start-ups**
- Especially scaling **Industrial start-ups**
- Our Unicorns are great, but there are not enough industrial enough, with a few exceptions, I've got nothing against Just Eat, Appliances On-line, Revolut's....
- But they don't create the same amount of value in terms of deep tech, innovation and ultimately well paid jobs. Deliveroo does create plenty of jobs, but we need to see more created by the Deepmind's & keep most of their value here, and hopefully list on the FTSE.
- Germany btw, has less start-ups in the UK, but they have more in this industrial deep-tech space, as that is what will keep their advanced manufacturing industries alive – and create new ones of course.
- I was reflecting on the **last major tech company the to put its HQ in the UK and list here? Could I count Sage?, maybe AVEVA, now bought by the French Group Schneider, Maybe Occado?..... I suspect the last major major tech listing we had was Vodafone? And we definitely haven't created the Google's or Tesla's....**

- **And to scale our start ups & our existing companies, we need**
- **To invest in and scale up our innovation ecosystem more.**
Here just a few examples & comparisons
- **Example 1: The UK Government's principal investment is the Faraday Battery Challenge, a total of £541m over a 9 year period. The EU, largely focused on Germany and France, has invested at least Euro 13 billion.**
- **Example 2: Semiconductors – Europe has passed a 45-billion-euro plan to boost its market share in semiconductors to 20% by 2030 from 8%. In the UK we are still waiting for a long promised semi-conductors strategy**
- **Example 3: Catapults - Investment in Fraunhofers is €2.8 billion pa. Investment in all Catapults this year is £240m = 3% of UKRI Budget. Innovation / Translational research has a different scale and importance!!**
- **The recent Paul Nurse Review on Our Research & innovation ecosystem also sites the weakness in our translational research as a problem**
- **And all this before the USA IRA at \$400 BILLION!!!! -which is focusing the world's mind on industrial policy.**
- **But, it's true that we can't compete on scale in all these areas – we just aren't big enough**
- **Therefore - we need to collaborate on key major programmes – we can't do it at scale alone, but we can take leadership, on Hydrogen, CCUS, SMR's, 5G/telecoms, AI etc**
- **Which is of course why Horizon is so important, and I don't need to convince you of that!!**
- **What I'm really saying is that we need an Industrial Strategy, that takes a long-term view**
- **And only with that can we create the new green industries of the future with many 1000s new exciting & well paid jobs up and down our country**
- **And then there is something that we need,**
- **& that is Our leadership – my last topic for this evening – and my hope for a better future !**

But it starts with some more bad news - If we think politicians are going to resolve this, & create our next industrial strategy, then in 10 years time, we will come back here and still be disappointed.

Here are just a few examples:

- **Horizon** – I think I'm safe in saying that there is not one person in this room that doesn't think we should be fully re-joining Horizon & taking leadership in it – yet our Government is dithering – The question is, why are **we** letting that happen?
- **Industrial Strategy** – I have sat on every industrial strategy council in this country for the last 15 years – each time we got a new Government / a new SOS we changed direction, went over old ground. One SOS couldn't bring themselves to say the word Industrial Strategy and finally another one came along and killed Industrial Strategy dead.

- How can one new person arriving new each time, have such a marked impact on a strategy that is fundamental to the UK for the next forty years. How can one person be allowed to kill the Industrial Strategy approach all together? **How have we let this happen?**
- **[Investment Zones – if they were so good why weren't we, the business and innovation leaders not calling for them?]**
- [We have had 22 changes in our **investment tax incentive** (sometimes disincentive) arrangements in the last 3 years - & businesses can't plan – how have we let that happen?]
- **[The Governments push on de-regulation – Is that really what we as business people and academics want? We understand our responsibility to the environment and our workers don't we? – why aren't we balancing this conversation more?]**
- **Made Smarter: A programme I led, with the support of many industrialists, some in this room – to help accelerate the adoption of industrial digital technologies – We've had to convince EIGHT Secretary of States that have led BEIS & at least as many junior Ministers – each sceptical, & not prepared to work in true partnership to really scale the activity.**
- **I'm delighted it is still going – and having strong impact and that it's in the very capable hands of Brian Holiday who cares passionately about this & I hope you don't have to convince 8 more SOS's!!**

- I could go on – But you've got the drift **there is a total lack of long termism - & we as business people, as academics – we absolutely can provide that!**

- **I'm afraid it is down to us**

& to provide the necessary leadership - We need to collaborate better, **Royal Society, RAE, RSA** , Our many Institutions – IET, IMECHE etc, Our many business groups – **Make UK and individual business leaders.**

- We need a meaningful & impactful Ind Strat Council – A proper Partnership – I'm pleased that the Labour Party have committed to this.
- We need this **not just to become a Science Superpower - But an Industrial Super Power again – A Green Industrial Superpower.**
- **That's what Labs to Riches & what we in this room are all about isn't it? – the scientists, innovators, industrialists & Government coming together – to turn Science into industries and wealth creation for the country.**
- We absolutely can make this happen
- We must make this happen
- **I call on all industrial leaders, academic leaders & leaders of Government in this room and outside to get together and create a bold UK industrial Strategy & make it happen!!!**