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We asked **Peter Laybourn**, chief executive of International Synergies Limited, to tell us "what's new in industrial symbiosis" one year on from his last article for the Journal... so he did, and it's very much a global practice...

One year on from my last article for CIWM, I am delighted to have the opportunity again to update you. It's been an eventful year for both International Synergies and industrial symbiosis more generally, not least observing just how much the term "synergy" is now used in everyday language and industrial symbiosis in policy language.

There have been two exceptional highlights – firstly, International Synergies organising the G7 Alliance for Resource Efficiency's first thematic workshop with Defra, which was on the topic of industrial symbiosis, held in Birmingham in October of last year at the behest of the German and UK governments (the Japanese are taking it forward with G20). The workshop ended with a challenge to governments to compare the cost-effectiveness of industrial symbiosis to other policies to reduce carbon and waste and create jobs – the evidence is very much in our favour!

And secondly, International Synergies celebrated its 10th anniversary event in style at the Birmingham Council House, with friends from far and wide!

International Synergies Northern Ireland is celebrating 10 years as well – as the longest facilitated programme in the world. Uniquely in Northern Ireland, the Industrial Symbiosis Service is supported by Invest Northern Ireland, the regional business support agency. The emphasis of the Service is therefore on improving business competitiveness by reducing the cost base and generating business opportunities.

Since 2007 it has achieved real economic benefit of more than £40m for Northern Ireland businesses through free

advisory support, guidance and introductions providing innovative solutions for wasted resources. Cost savings are just part of the story; diversion of waste from landfill, reduced greenhouse gas emissions and jobs are just some of the benefits that the Industrial Symbiosis Service has brought for business. Following in the footsteps of the national Industrial Symbiosis Programme (NISP) England, this free service has helped over 1,600 businesses across Northern Ireland.

To celebrate its 10th anniversary, the Industrial Symbiosis Service will host an international conference on 31 May 2017, focussing on industrial symbiosis on a global and local scale and, while providing a platform for discussion and networking will demonstrate how industrial symbiosis in Northern Ireland has achieved outstanding results for businesses from all industry sectors.

Given Northern Ireland's continuing success, I expect the Scottish Government might be regretting Zero Waste Scotland's decision to bring the Scottish Industrial Symbiosis Programme (SISP) to an end in 2011, having delivered in its four short years (and on a modest investment of just over £1m) outputs including over £4m in cost savings and 194Kt CO₂ reduction.

The Next Frontier

THE NEXT frontier to bringing industrial symbiosis mainstream is to address the market failure of information that prevents some companies from participating, particularly in the absence of facilitation. International Synergies' current SYNERGie® software, used in over a

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dozen countries and translated into five languages, hosts data from over 20,000 companies worldwide (thus laying to rest the myth that companies won't share information – under the right conditions they clearly do).

With a Department for Business, Energy & Industrial Strategy (BEIS) ambition to develop a national materials database to address concerns of resource supply risk, we may already have the answer in the form of tried and tested (and populated) SYNERGie®.

Many governments and organisations have been investing in establishing passive waste exchanges, despite the resounding lack of successful synergies resulting from them in any country. International Synergies is a partner in a pioneering Horizon 2020 project called SHAREBOX, to fundamentally revamp the existing software; this next-generation ICT (information and communications technology) platform is designed by industrial symbiosis practitioners, built on over a decade of delivery experience, to support industrial symbiosis. Project partners from Germany, Spain, Netherlands, Switzerland, Turkey and the UK are working to pilot the new platform in early 2017.

On the cities theme, we have been invited to present at the 2016 Circular Economy European Summit in Barcelona, advancing the concept of urban (or city) symbiosis where the proven NISP methodologies are extended beyond just industry to include communities and other stakeholders. A concept not too dissimilar to our own Regional Economic Development through Intelligent Based Industrial Symbiosis (RED IBIS) methodology, which we first proposed in 2008 and applied to the Tyseley Environmental Enterprise Zone in Birmingham, with the help of Birmingham City Council; and to the Burnt Mills industrial estate, with support from Basildon Borough Council and Essex County Council.

With help from the British Council (Newton Fund) we have just finished delivering RED IBIS training with the BEBKA region (Bursa Eskişehir Bilecik) of Turkey, and we look forward to welcoming them to Birmingham for a study visit this month. We can learn a lot from Turkey... it has the most supportive legislative framework for industrial symbiosis from anywhere in the world. This

ranges from explicitly promoting industrial symbiosis in regional development plans (particularly aimed at Organised Industrial Zones) to pioneering the inclusion of industrial symbiosis as a mitigation policy in its Intended Nationally Determined Contribution (INDC) under the COP21 agreement.

IS – A Good Track Record

GIVEN THE pressing global agendas of competitiveness, resource security, climate change and the need for green growth – industrial symbiosis has a proven track record of delivery on all these agendas – it is critical we succeed in getting industrial symbiosis mainstream as soon as possible.


The enabling ICT is an important part of this, as is getting the word out to new regions. We've dramatically scaled up our activities in Africa: following a three-year run in South Africa (including informing its nascent development of a national industrial symbiosis strategy), we're now working

"Industrial symbiosis is an association between two or more industrial facilities or companies in which the wastes or by-products of one become the raw materials for another"


with partners in seven African countries on a SWITCH Africa Green project to upskill micro, small and medium companies to enable them to save money and resources, and become more competitive through industrial symbiosis.

After speaking at the African Roundtable on Sustainable Consumption and Production in Uganda, we were invited to join an expert panel involving UNIDO, the World Bank, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and the University of Lausanne on urban symbiosis.


The rest of Europe may see more action on industrial symbiosis too, as The Council of the European Union



HEAVY DUTY HEADSTOCK, PROTECTED DRIVELINE, INCHING PEDAL, WET INBOARD BRAKES



WASTE MANAGER RANGE		
MODEL	CAPACITY	LIFTING HEIGHT
ZEUS 37.7	3,700 t	7.35 m
SAMSON 45.8	4,500 t	7.90 m
SAMSON 60.9	6,000 t	8.60 m
SAMSON 65.8	6,500 t	7.70 m
SAMSON 70.10	7,000 t	9.65 m
HERCULES 100.10	10,000 t	9.50 m
HERCULES 120.10	12,000 t	9.40 m
HERCULES 190.10	19,000 t	10.20 m
HERCULES 210.10	21,000 t	10.20 m



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Top: the G7 Alliance for Resource Efficiency's first thematic workshop with Defra. Above: a PNSI workshop in Bretagne

adopted – in June 2016– the following conclusion on the action plan for a circular economy: "CONSIDERS the active involvement of the private sector and other stakeholders across Europe and at the global level a key element for a successful and more effective transition towards a Circular Economy; ENCOURAGES the EU and the Member States, at all levels of government, to actively engage the private sector to promote cooperation, innovation and industrial symbiosis projects within and across sectors and value chains; including by addressing specific challenges in the transition to the Circular Economy, through agreements between stakeholders in society and governments."

In parallel, and only one of many recent studies on industrial symbiosis at the EU level, DG Grow is commissioning a report to assess the market benefits of industrial symbiosis across Europe... I anticipate it will come up with a very, very big number!

Part of the advancement of the circular economy in Europe is the French equivalent of NISP (PNSI), which we are proud to be associated with and which is doing very well. Supported by ADEME (the French Environment and Energy management Association) under the umbrella of Institut de l'Économie Circulaire, the new regions of Nouvelle Aquitaine, Bretagne, Normandy and Auvergne-Rhône-Alpes are all participating. Already, in just one year, 650 companies have engaged in the facilitated programme, providing data on almost 10,000 resources.

One mechanism through which we will continue our close European ties is through an Interreg programme led by Birmingham City Council (BCC) entitled "Transitioning Regions towards Industrial Symbiosis" (TRIS). We are working with BCC and municipalities from Sweden, Hungary, Spain and Italy to enable a systemic uptake of industrial symbiosis in the regions. TRIS will deliver

policies that support SMEs to use industrial symbiosis to increase productivity and to engage in industrial symbiosis to enhance competitiveness and productivity, prevent/reduce industrial waste, and seek to further embed industrial symbiosis in European policy..

One of the most pleasing and innovative recent developments has been the growing interest from the financial sector in industrial symbiosis. Nowhere has this been more evident than the hosting of an industrial symbiosis workshop by HSBC in its Midlands Commercial Centre later this year for the benefit of its SME clients, particularly those from the construction sector.

Further afield we continue our work in China with the support of the UK Foreign and Commonwealth Office's (FCO) Prosperity Fund. Working alongside Wuhan University of Science and Technology we are embedding an industrial symbiosis approach into infrastructure activity in Wuhan following on from a successful circular economy pilot we delivered last year in Hubei Province. We have also just hosted a delegation from Yingjan, alongside BCC, on the circular economy, which I believe to be the eighth time we have hosted Chinese delegations.

The Brexit Issue

AND OF course, a word on Brexit... we have enjoyed working in something like 15 European countries and have benefited from European policy and recommendations in favour of industrial symbiosis, culminating in that earlier Conclusion in the Circular Economy Action Plan.

Irrespective of the vote, we still have the opportunity and skills to support UK plc through industrial symbiosis, and hope that the UK Government adopts an enabling strategy that wasn't present at the time of NISP.

Much of this update has touched on international activity, but the implication for the UK is clear. The methodology we're implementing globally was born and bred here in the UK, but under austerity conditions was stopped in 2013. This year, Sir Mark Walport's (Chief Government Scientific Officer) Annual Report, *Waste: Closing the Loop on Resource Efficiency*, will feature industrial symbiosis as a proven and cost-effective approach to closing loops..

One conclusion could be that the UK should be doing more of it, more urgently and smarter (especially in light of Brexit). We will be putting forward to government for consideration a coherent national industrial symbiosis strategy that would, if implemented, support many of the policies of the new departments BEIS and DIT, together with Defra, DFID, DCLG, FCO and the Treasury.

Finally, I would like to add my thanks and best wishes to the outgoing CIWM chief executive, Steve Lee, who has done so much to shift the agenda in the UK from waste to resource. ■



Peter Laybourn is the founder of International Synergies Limited and the creator of the National Industrial Symbiosis Programme (NISP), a model which has been exported to over 30 countries. He was instrumental in gaining recognition from the G7 Alliance for Resource Efficiency that industrial symbiosis is an effective tool for green growth.