THE GLOBAL RACE FOR RAW MATERIALS

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The European Union first adopted a raw materials strategy in 2008, at a time when commodity prices were at an all-time high and fears were running high of a global scramble for natural resources. The financial crash that followed conveniently swept the issue under the carpet. But this may have only been temporary.

In this special report, EURACTIV looks at the raw materials that are essential for digitisation and the transition to a green economy.
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Markets for raw materials have recovered from the 2008 financial crash, fuelled by the continued digital transformation of the economy and the rapid deployment of green technologies. Is the world on track for a repeat of the resource boom seen in the early 21st century?

The global fight for natural resources was nearing an all-time high when the European Commission first laid out an EU strategy for raw materials, back in 2008.

“A strong and unforeseen surge in demand” driven essentially by double-digit growth in China, had led to a tripling of metal prices between 2002 and 2008, the Commission said at the time.

China, the world’s de facto sole supplier of rare earth metals, took advantage of its monopolistic position to impose restrictions on exports, prompting Japan to start stockpiling in fear of a supply crunch.

At the European level, those concerns resulted in the establishment of a “raw materials diplomacy” to secure supplies from abroad – including legal action at the WTO when necessary – a push for resource-efficiency inside Europe, and the creation of a list of critical raw materials to monitor potential supply risks.

Those fears were quickly swept away by the financial crisis, which depressed the global economy for many years.

But ten years later, the fundamental economic trends that

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Critical raw materials “are irreplaceable in solar panels, wind turbines, electric vehicles, and energy-efficient lighting” which are essential for the energy transition, the European Commission said in its latest Report on Critical Raw Materials and the Circular Economy, published in January 2018.

Everyday consumer products in the telecoms sector are also highly exposed to raw materials price fluctuations. “A smartphone might contain up to 50 different metals” all of which provide essential properties to the final product, the EU executive remarked, pointing to the importance of critical raw materials for high-tech products.

And the majority of these primary raw materials are produced and supplied from non-European countries, the report pointed out:

Nowadays, industry people say supply risks are driven mainly by emerging demand for new products such as electric cars.

“Raw materials will be essential for manufacturing the products of the future. They form the basis of modern societies, our cities, digitalisation and the European energy transition,” said Roman Stiftner Secretary-General of the European Mineral Resources Confederation (EUMICON).

“Megatrends such as digitalisation and the decarbonisation of transport and production are resulting in new demand for raw materials, in terms of volume and of complexity,” EUMICON said, in its raw materials charter, published earlier this year.

Other megatrends identified by EUMICON include increased wealth and global population growth. Global GDP is ten times higher than 50 years ago, and the world’s population has doubled. A further 3 billion people are expected to join the middle-class between 2010 and 2030, and all of them will want cars and smartphones.

Meanwhile, urbanisation, digitalisation, the low-carbon transition and the switch to electricity as the main source of energy for industry are further accelerating developments, it says.

“Electricity demand is rising, while increased production of wind and solar energy requires a greater quantity of a different mix of raw materials,” EUMICON pointed out, wondering whether the world has entered “a new age for metals and minerals”.

To be sure, the digital revolution that was already underway ten years ago has accelerated and branched out into new areas, creating excitement around things like robotics, smart cities, industry 4.0, electric vehicles, autonomous driving, and artificial intelligence, to name a few buzzwords.

On the manufacturing side, concepts have evolved. The European Commission’s resource-efficiency agenda of 2011 has morphed into a more ambitious circular economy strategy, which places recycling at the centre of attempts to close raw material loops and keep valuable resources inside Europe.

NEW RISKS, NEW SOLUTIONS

However, recycling has its limits, even under the most optimistic scenarios. “The overall demand for raw materials is growing, and recycling alone cannot supply the market,” EUMICON said, citing aluminium as a case in point.

And “since recycling efforts will not be sufficient to feed the demand, supply of primary raw materials is irreplaceable,” it argues, calling for “new solutions” to establish “a future-proof raw materials policy”.

This includes exploiting Europe’s own geological deposits as well as securing access to raw materials on global markets to strengthen the future resilience of European industry.

But is Europe – and indeed the world – better equipped to deal with those global challenges today than it was ten years ago? From a technological point of view, maybe yes. But from a global trade perspective, definitely not.

Under President Trump, the United States has taken a hostile stance against Europe and China on
trade, launching attacks on all fronts, ranging from steel to cars and food, raising the spectre of a new global trade war.

China itself has long pursued unilateral policies on access to raw materials, cutting deals with resource-rich African countries in return for cheap loans and infrastructure.

This makes the current trade environment more volatile than it was ten years ago, under a more accommodating Obama administration and a less assertive China.

“This time around, governments seem to be taking a more assertive, and in some cases, pre-emptive stance,” according to the Centre for European Policy Studies (CEPS), a think-tank.

“Witness, for example, China’s disputes on rare earth elements or President Trump’s Mineral Order at the end of 2017. This new attitude may pose new challenges for EU trade policy,” CEPS wrote in a policy paper published in February.

A FUTURE ‘MADE IN EUROPE’?

Faced with those challenges, Europe has also taken a more assertive stance, launching WTO disputes against Chinese export restrictions on raw materials such as graphite, cobalt, copper, lead and chromium.

In his latest State of the Union speech, Jean-Claude Juncker proposed a new ‘Africa-Europe Alliance’ that hopes to tap “the full potential of economic integration and trade,” with an objective to leverage up to €44 billion of investments into the region by 2020.

At home, the European Commission has targeted an increase in the recovery of key raw materials as part of its Circular Economy Strategy put forward in 2015, placing the emphasis on recycling and reuse with a view to “closing the loop” of product lifecycles. Supporting innovation in European recycling technologies is also part of that plan.

But EUMICON says technological solutions, although necessary, won’t go far enough to meet the challenges Europe is facing.

“A complete approach to sustainability requires us to consider economic, environmental and social sustainability together,” EUMICON said, stressing that “all three aspects need to be addressed with equal focus” in order to ensure a future that is “Made in Europe”.

What it boils down to is the importance of strengthening raw material value chains in Europe at a time when the international trade order is being challenged.

“The EU will need to develop a proper thinking how to put raw materials in the centre of its industry strategy, since we will be facing a new global race for raw materials in the future,” said Gilbert Rukschcio, managing partner at Pantarhei Advisors, a consulting firm based in Austria.

“Global megatrends such as digitalisation and the energy transition will also force Europe to act on this field,” Rukschcio said.
Europeans have to be “very vigilant” that today’s dependency on imported oil and gas is not replaced by dependency on lithium, cobalt, copper and other raw materials that industries need for the green transition, Maroš Šefčovič told EURACTIV.

“I really think that, when it comes to the issue of dependency, we could end up in a situation where raw materials become the new oil,” the European Commission vice-president warned in an exclusive interview.

Maroš Šefčovič is vice-president of the European Commission in charge of the energy union. He spoke to EURACTIV’s energy and environment editor, Frédéric Simon, at the end of EU Raw Materials Week 2018.

**INTERVIEW HIGHLIGHTS:**

- European Commission is looking at access to raw materials with increased scrutiny
- Discussions intensify with EU member states on how to develop mining activities inside Europe, re-opening old mines and

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Opening new ones

- Initiatives on battery manufacturing are in the pipeline for the coming year, including standardisation and regulatory alignment.
- Lithium refining is being promoted as part of a broader strategic push to develop an entire battery value-chain inside Europe.
- New Africa-Europe Alliance to promote sustainable mining, with the aim to leverage up to €44 billion of investments into the region by 2020.
- This means European companies should also be ready to pay taxes, and play a role in the local economy, to the benefit of African countries.

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It’s been ten years now since the European Commission adopted its raw materials initiative, in a context of increased competition for natural resources, which saw metal prices triple between 2002 and 2008. Those worries were swept away by the financial crisis but now that the economy is back on track, do you see a risk that raw material prices will start rising again?

It’s already happening. And the strategy that we adopted ten years ago had three priorities which are still relevant today. The first is access to raw materials outside of Europe; the second is mining raw materials inside Europe in a sustainable way; and the third priority which is becoming even more important in the coming years, is how we can improve reuse and recycling.

All the focus now in the European Commission is to reduce dependency on fossil fuels. But we want to avoid trading our dependency on oil and gas with dependency on the precious metals and raw materials that we need for the green transition.

This is why we are looking at access to raw materials with increased scrutiny – because they are often used in the production of high-tech electronic devices. And we continue to update our list of so-called critical raw materials every three years. We had 14 raw materials on the list in 2011, 20 in 2014 and now we have 27 in 2017.

But I was also intrigued to see lithium refining something that can be done so cheaply abroad that it wouldn't make sense economically? Or is lithium refining something that can be done so cheaply abroad that it wouldn't make sense economically?

We have very solid reserves of lithium in Portugal, in the Czech Republic and in the Nordic countries. But we do not have the refining ability. So even if we extract the lithium today, we have to send it to China for processing.

Is that what the European Commission means when it comes to the promotion of entire value chains in Europe? Or is lithium refining something that can be done so cheaply abroad that it wouldn't make sense economically?

We clearly have to cover this gap. Before Christmas, we will invite the main companies in Brussels to discuss how we can cover this gap.

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It's only logical that we should have the whole value chain in Europe. And that is one of the missing links that we have to cover. We are ready to discuss not only the regulatory aspects of course but also financial assistance – be it under the Important Projects of Common European Interest (IPCEI) or under Public Private Partnerships with the European Investment Bank (EIB).

Because the demand for processed refined lithium will be quite big in Europe, so it makes sense to have lithium refining capacities here.

When we started the European Battery Alliance, we were five years behind Asia. And thanks to concerted efforts, we reduced that gap by two years. And I’m sure that if we continue at this pace, we will quickly catch up. In this dynamic process, we are discovering what we are missing. And clearly, refining is something that we need to take care of.

Does it make sense economically to develop mining activity in Europe when labour costs, social and environmental standards are higher than in China or Africa? Or is it something that has to be done because it’s strategic?

There are several aspects. There are between 30 million people in Europe employed in jobs linked to extractive industries in Europe, so there is an important job creation and development aspect.

The second aspect, indeed, is that developing mining activities in Europe is of strategic importance.

Today, 50% of cobalt mines in the world are managed by China. And we see there is a strategic drive by China to have primary access to these precious metals and materials. Unfortunately, we don’t have the best history in dealing with access to these mines once they’re under Chinese control. This is why we launched these WTO cases in 2012 and 2014 on which we received a favourable ruling. A third case is still pending and we also think it will be ruled in our favour.

But we lost some time in the process because we wanted to be on a legally sound basis. And in the meantime, China further consolidated its position. So I think we have to do a strategic push for that – to make sure that countries have rules in place so that mining is done in a sustainable way.

The same applies to Europe of course. When I talk to millennials, they want clean cars and they want the full story. They want a clear understanding that low-carbon renewable energy was used for the production of the car, that the raw materials were extracted in a sustainable way and that the batteries and everything that is in the car will be recycled afterwards. All of this is important for us as well.

This is why we are also looking at Africa. We want to use the new drive for a new EU-Africa partnership to promote sustainable mining and establish fair trade relations when it comes to raw materials.

Can Europe play on an equal footing with China in places like the Democratic Republic of Congo?

We first have to realise that 50% of Africa’s exports to Europe are raw materials. In most cases, our companies respect labour codes and other rules of sustainability, to make sure supplies to Europe are in accordance with our values. Companies like Umicore have shown us that this is possible.

But of course, the Congo is a challenge. This is why we diversify supplies and look for all the opportunities we have in Europe. And we want to develop trade relations with countries where these materials can be extracted in a sustainable way.

It’s a very strategic discussion and I’m happy we are having it right now. We are progressing well but I’m also sure that this is a challenge that is going to stay high on the agenda in the future.

Can raw materials be one of the pillars of the proposed new ‘Africa-Europe Alliance’ that European Commission President Jean-Claude Juncker mentioned in his State of the Union speech earlier this year?

We want to treat Africa in a different way, not as a donor group of countries but as a partner which can change the reality on the ground.

You know, Africa is one of the continents which is the most affected by climate change. So they should be the first to develop electricity from microgrids and solar panels, benefitting from the experience we gained in Europe with the energy transition. They can develop new activities and economic models in Africa.

Of course, we very much insist on fairness and transparency when it comes to trade relations. And for European companies, it means they should be ready to pay taxes and play a role in the local economy to the benefit of African countries, bringing their know-how and investments in new energies.

That is something I believe will be more and more appealing for African countries. Because with Europeans you know what you get – a transparent approach, companies that pay taxes and take care of the environment.

And then, we also have €44 billion of investments ready for African countries under the Africa-Europe Alliance, focusing on projects that bring value to local communities and the wider African continent.

We want to use the experience we gained with the Juncker investment plan for Europe and use the same leveraging capacities of the European Investment Bank (EIB) and other

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investment banks in Africa. And we believe this €44bn can be mobilised by 2020. It’s a lot of money, and we want to channel it in those strategic sectors that can change things on the ground.

Inside Europe, a lot of attention is also being placed on so-called “urban mining” and recycling. How much can realistically be expected from that in the short term?

Recycling and reuse definitely have to be part of this European green story – certainly when it comes to batteries and the circular economy.

There is an example that European company Umicore likes to quote a lot: If we were to collect all the smartphones currently in our drawers and recycle them, we could manufacture 4 million car batteries. That’s the potential currently in Europe.

When it comes to batteries, we want to proceed quickly in three areas: The first is the batteries directive, which we can refit to put more emphasis on recycling and reuse. The directive is ten years old and we have to upgrade it. It’s a review exercise that we want to do under the mandate of this European Commission.

The second thing is standardisation. We want to develop new standards for batteries, and we are currently working with CEN and CENELEC to change the standards in a way that reflects our European narrative of sustainable materials.

This includes also bi-directional software. We don’t want batteries just to power the car, we want it also to be able to store energy and sell it to the electricity grid at peak times when the car is not driving. This vehicle-to-grid connection fits very much with our new electricity market design proposal which is currently being finalised in the Council and Parliament.

And the final stage is reuse. When batteries aren’t good for cars anymore, they can still be good for smart homes, for industrial storage use, and recycling. And that is also something we want to propose under this mandate, before autumn 2019.

The last regulatory aspect is eco-design. We want to make sure that only the batteries which have super-high quality features and are compatible this philosophy are allowed on the European market. This is something we will present within a year, so hopefully, we can celebrate the second anniversary of the European Battery Alliance with a clear policy on those three important strands.

The recyclability of batteries is very much related to the design of a product. The InnoEnergy network of 260 innovation and industrial actors have very specific projects to push the battery alliance forward. And one of them is a clearinghouse which involves all actors upstream in the value chain to mutualise the costs on the design of batteries to make sure that, at the end of the lifetime of a product, second use of raw materials is made easier right from the start.

That would make it much easier to disassemble the product.

How much support do you have from EU member states on the battery initiative?

There is intense political will to go for it. Both national governments and industrial players are pushing for that. And I think we have the regulatory power and the financial means to steer it in that direction.

Since we started the European Battery Alliance one year ago, the industry and private investors have accumulated €100 billion of ongoing or planned investments, which is really huge.

We are also working very creatively with state aid under the IPCEI mechanism. I was in Germany a few days ago and Peter Altmaier said he was ready to use €1 billion in the form of eligible state aid. And then we have the financial muscle with the EIB to finance these things.

So I think we have all the right elements step things up. A lot still needs to happen but I think we have all the right elements to do a catch-up with Asia. We were already able to take two years out of our five-year gap with Asia.

But a lot still needs to happen. Raw materials will be one of the key issues to be resolved to preserve our technological sovereignty.

When do you believe the gap with Asia can be closed?

Catching up will be quick – I hope that by the end of this decade we will be on par with Asia. And I believe we will actually be leading because we will go for high-quality. Once we have a first gigafactory to manufacture batteries in Europe, which should happen next year, then we expect between 80 to 100 new electric car models in the showrooms in Europe by the end of the next decade.

And once we develop acceptance with the consumers, and there is further development of infrastructure, their appetite for this new technology will grow and it will evolve very quickly. So I hope that by the end of the decade, we will be on a par mostly with China when it comes to the mass production of batteries.

And I have full trust that, when it comes to image, European carmakers will want to catch up with American image-makers. And by the end of this decade, Europe will have cars which are as “cool” as those we can see on the other side of the Atlantic.
The European Union is accelerating plans to develop lithium mining and refining capacity on its territory as part of a concerted EU push to develop a strategic value chain for manufacturing electric car batteries inside Europe.

With the electrification of transport, the race to develop a complete battery manufacturing value chain in Europe is now underway. And despite a slow start, the EU is rapidly catching up.

One year ago, the European Commission launched a European Battery Alliance, bringing together automakers, chemical and engineering executives in a bid to compete with Asian and American manufacturers.

The objective is to build a whole value chain for the manufacturing of batteries in Europe, a strategy that came to the forefront earlier this year when the European Investment Bank (EIB) announced financing to build Europe's largest battery factory, in Sweden.

In order to complete the value chain, Europe now wants to secure access to the raw materials needed to manufacture the latest generation of car batteries, relying on lithium-ion technology.

“We are working a lot on batteries and the discussions there focus on cobalt, lithium, nickel and copper,” said Maroš Šefčovič, the European Commission vice-president in charge of the energy union, one of the EU’s flagship projects.

Inside Europe, attention has

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focused on mapping out the raw materials available on European soil so they can be exploited in a sustainable way.

“There are new projects for production in Europe. Mines are opening or re-opening and there is prospecting going on to open some new ones,” Šefčovič told EURACTIV in an interview.

Discussions at EU level include easing permitting procedures and ensuring coherence between different regulations, Šefčovič said, referring to discussions taking place with EU member states in a high-level group on raw materials.

**REFINING CAPACITY GAP**

The EU group also identified weaknesses, starting with a “gap” related to lithium refining capacity in Europe.

“We clearly have to cover this gap,” Šefčovič told EURACTIV. “We have very solid reserves of lithium in Portugal, in the Czech Republic and in the Nordic countries. But we do not have the refining ability. So even if we extract the lithium today, we have to send it to China for processing,” he pointed out, adding the issue needs addressing as a matter of priority.

“The demand for processed refined lithium will be quite big in Europe, so it makes sense to have lithium refining capacities here,” he argued.

Europe’s battery cell demand is projected to reach 200-gigawatt hours by 2025 – a market worth an estimated €250 billion annually, according to the European Commission.

Lithium-ion is the technology of choice for electric car batteries and will remain so for the next ten years at least, according to Eurobat, the association of European manufacturers of automotive, industrial and energy storage batteries.

The vice-president of the EU executive is now busy making plans to cover the lithium refining gap, saying the main companies involved in the supply chain will be invited to Brussels “before Christmas” to discuss how this can be done.

“We are ready to discuss not only the regulatory aspects of course but also financial assistance – be it under the Important Projects of Common European Interest (IPCEI) or under Public Private Partnerships with the European Investment Bank (EIB),” Šefčovič said.

**“STRATEGIC” RAW MATERIALS**

The race for lithium illustrates a wider EU push for raw materials that are expected to become increasingly strategic with the digitalisation of the economy and the transition to cleaner forms of energy.

Producing a 3-megawatt wind turbine requires 335 tonnes of steel, 4.7 tonnes of copper, 1,200 tonnes of concrete, 3 tonnes of aluminium, 2 tonnes of rare earth elements as well as zinc, Šefčovič pointed out, saying this was “really illustrative of the volume of raw materials you need for the green transition.”

As a result, developing mining activities in Europe has become “of strategic importance,” said the Commission vice-president.

“I really think that, when it comes to the issue of dependency, we could end up in a situation where raw materials become the new oil,” Šefčovič warned, saying Europeans have to be “very vigilant” that today’s dependency on imported oil and gas is not replaced by dependency on lithium, cobalt, copper and other raw materials that industries need for the green transition.

**RECYCLABILITY AND REUSE**

Besides relaunching mining activity in Europe, the EU also intends to improve the recyclability of batteries so that the materials they contain can be more easily recovered.

This includes a review of the ten-year-old batteries directive and a push for standardisation in the way car batteries are designed so they can be more easily disassembled for recycling.

Umicore, a Brussels-based mining company involved in recycling and materials for rechargeable batteries, says the potential for smartphone recycling in Europe today is equivalent to producing about 4 million new batteries for electric cars.

“Globally, there are 2 billion mobile phones, tablets and consumer electronics that are sold and only 10% of them are being recovered,” said Guy Ethier, senior vice-president at Umicore. This means “tonnes of metals” are currently sitting “in the drawers of people” and are not being recovered, he told EURACTIV, saying Europe was no exception.

Regarding electric cars, Ethier said the business case for recycling will be obvious once the first generation of mass-produced electric vehicles reaches the end of their life cycles ten years from now. “There is a good business case for battery recovery,” Ethier said. “And we are willing and open to export our technology to other places in the world where there are end-of-life materials.”

The International Energy Agency expects numbers of electric vehicles on roads worldwide to be around 40 times higher in 2030 than in 2017, leading to a sharp rise in spent batteries becoming available for recycling.

And when car batteries reach the end of their lives, EU regulators believe they can still be reused for other applications before recycling – like smart homes, or for industrial storage.

Policy initiatives on battery

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recovery, reuse and recycling will be launched under the European Commission’s current mandate, “before autumn 2019,” Šefčovič said.

“AFRICA-EUROPE ALLIANCE”

The second pillar of the European discussion on batteries covers relations with regions supplying or handling the raw materials – mainly China and Africa.

And the challenges there are huge. Umicore’s Guy Ethier said the company was “very concerned” about “questionable” labour and environmental standards in some mining regions, citing cobalt in the Democratic Republic of Congo (DRC) and lithium in South America’s Atacama desert.

A survey by Amnesty International, published in November 2017, uncovered “major blind spots” in the supply chains of major electronics and car companies, including child labour and other human rights violations linked to cobalt mining in the DRC.

More than half of the world’s cobalt, which is a key component in lithium-ion batteries, comes from the DRC, and 20% of it is mined by hand in artisanal mines, said the Amnesty report, Time to Recharge.

The European Union is aware of those concerns but has so far failed to put in place effective policies to prevent human rights abuses in supply countries. Today, 50% of cobalt mines in the world are managed by China, the Commission says. And once they fall under Chinese control, labour and environmental standards are more difficult to enforce.

Now, the Commission says it wants to make “a strategic push” so that resources like cobalt are mined in a way that preserves the environment and benefits local communities.

“We want to use the new drive for a new EU-Africa partnership to promote sustainable mining and establish fair trade relations when it comes to raw materials,” Šefčovič said.

This is part of a new “partnership of equals” between Europe and Africa announced by Commission President Jean-Claude Juncker in his recent state of the union speech. The new partnership is based on a holistic approach to Europe’s relations with Africa, which includes €44 billion for investment projects with provisions on fair trade to ensure they benefit local communities.

It also means European companies operating in Africa “should be ready to pay taxes and play a role in the local economy to the benefit of African countries, bringing their know-how and investments in new energies,” Šefčovič said.

The EU’s stated objective is to offer an alternative to Chinese investors and take a bigger slice of mining activities in Africa, based on a long term approach.

“That is something I believe will be more and more appealing for African countries,” Šefčovič said. “Because with Europeans you know what you get – a transparent approach, companies that pay taxes and take care of the environment.”
Trade unions expressed concerns on Tuesday (20 November) about a shortage of skilled workers in the extraction industry, which they say is becoming a problem for Europe at a time of rising global demand for raw materials.

“Young people are not interested in working in the raw materials industry.” This is the stark reality observed by Peter Scherrer, deputy secretary general of the European Trade Union Confederation (ETUC).

The union leader was speaking at a dinner debate hosted by the European Mineral Resources Confederation (EUMICON), which discussed the global race for raw materials under the title “Building a New World, Made in Europe”.

According to Scherrer, working conditions in the extractive industry should be improved in order to make the sector more attractive to young people.

The figures in terms of education are depressing. Mineral processing graduates in Europe are almost negligible, representing around 1% of the total on a global level, said Christian Egenhofer, head of the energy and climate programme at the Centre for European Policy Studies (CEPS), a think tank.

And the situation is unlikely to improve in the short term, Egenhofer said, pointing to the decline of educational programmes related to the extractive industry in most European countries.

The European Commission is aware of the issue, he told EURACTIV.

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However, there is little it can do since education is not an EU competence.

**DEMOGRAPHIC PRESSURE**

The shortage of European graduates raises concerns among industry representatives. Skilled workers are badly needed in order to meet rising demand for raw materials fuelled by a growing world population, said Jill Duggan, director at the Cambridge Institute for Sustainability Leadership (CISL) in the UK.

“There are big challenges the global community is currently facing: the growing population, the digitalisation of the economy and global warming,” said Duggan, who is also director of The Prince of Wales’s Corporate Leaders Group (CLG).

“Perhaps the biggest of these is population, a fact that is rarely acknowledged,” she said, quoting United Nations figures showing that the global population is heading towards 9.7 billion in 2050 from a mere 3 billion in 1960.

Demand for raw materials grows in direct relation with the rise of the middle-class in developing countries who adopt Western-style consumption patterns, Duggan explained. But that also comes with opportunities, as the digital economy allows developing nations to leapfrog the stage of high fossil fuel consumption, she added.

**CONNECTING EDUCATION, RESEARCH AND INDUSTRY IN THE VALUE CHAIN**

Connecting trade unions, NGOs and academics with the industry is a pre-condition to improve skills and education and therefore meet the global demand for raw materials, said Roman Stiftner, Secretary-General of EUMICON.

At schools and university there is often a lack of understanding of the raw materials value chain, he pointed out.

“The new development in the industry poses huge challenges to traditional education,” he observed, questioning the ability of the higher education system to transfer the sets of skills and knowledge that the industry needs.

“A simple example is the composition of a modern smartphone. Investigating this and identifying the non-ferrous elements a smartphone contains is a highly informative activity,” he said, calling for forging alliances in education, research and development as well as mixing educational methods.

“Innovation in raw materials usage is key for a successful industry and innovative climate solutions,” he stressed, saying the message needs to reach “all workers, at factory and university level.”

In that respect, Stiftner welcomed EU plans to increase research funding.

“There will be a significant amount of money dedicated to research made available and we have to ensure that mid-size companies from the raw materials sector also have access to the funding,” he said.

As it is, the European Parliament’s Industry, Research and Energy committee on Wednesday (21 November) set out their scope and priorities for funding important areas aimed at stimulating future growth such as research, defence, space and digital technologies.

MEPs also welcomed the Commission’s proposal to create the first ever Digital Europe programme, and will invest €8.2 billion under the EU’s next long-term budget for 2021-2027. The funding is crucial to achieve the Digital Single Market strategy and to increase the EU’s international competitiveness, the European Parliament said in a statement.

Peter Scherrer agreed that research and development was key to the industry’s future growth, but that should also been done in cooperation with companies.

He said trade unions have built cooperation with business organisations like BusinessEurope in order to push for apprenticeships, a move he sees as essential to bridge the gap between the industry and the education sector.

“Through apprenticeships, students learn how the industry works and they can combine that experience with their education,” he said.

“Raw materials are difficult to get. When you want people to innovate, you need skilled workers in order to deliver,” he said, referring to discussions in Europe over battery manufacturing.

Human resources remain a key asset for EU mining companies, stressed Roman Stiftner. As raw materials prove more essential than ever for the global economy, education is the key to keep Europe at the forefront of global innovation, he concluded.
Forming the basis of our cities, digitalisation and the European energy transition, raw materials are essential components in manufacturing the products of the future, writes Roman Stiftner. With the emergence of new demand, now is the right time for stakeholders to come together and respond to this challenge, he argues.

Roman Stiftner is Secretary General of the European Mineral Resources Confederation (EUMICON).

Autonomous driving, artificial intelligence, the internet of things, the clean energy transition: the disruptive technological revolution, as well as the expansion of renewable energy use and mitigation of carbon dioxide emissions, require a whole range of new processes, products and innovative services.

All of these have a significant impact on the extractive industry and its value chains, resulting in the need for industry to respond to the new challenges. At the same time, such challenges give rise to unforeseen opportunities and potential new value chains. Raw materials form the basis for modern industrial societies, such as in Europe. Any change in the raw material base has a cascade effect on the continent’s industrial value chains.

Greater political focus on EU industry in recent years is connected
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with a broad range of issues arising from newly-evolving value chains and rising demand for raw materials. These include, for example, access to and costs of raw materials, product and process innovation, investment, skills, education and training, and regional and social implications.

TRANSFORMATIVE MEGATRENDS ARE DRIVING DEMAND FOR RAW MATERIALS

Some speak of a new age for metals and minerals. The resource intensity of our society is set to remain high, while increasing quantities of minerals in particular – some of which have been identified as critical raw materials – will be required to enable the transformation to a low-carbon economy.

It would be difficult to identify a production process that is not based on mineral raw materials, or for which tools and machinery requiring mineral raw materials are not used. Therefore, it is clear that demand for mineral raw materials will continue to grow.

At the same time, the EU’s 2050 decarbonisation goals need breakthrough innovation to bring about low-carbon industrial production, and they require European manufacturers to go beyond their existing high standards.

A key challenge is energy consumption and meeting the necessary demands on decarbonised electricity supplies. Renewable energy generation itself will require greater quantities of different raw materials than those used today, as renewables replace traditional energy commodities.

A HOLISTIC APPROACH TO THE CIRCULAR ECONOMY

A circular economy certainly has the potential to deliver innovative solutions. However, though many metals are permanent materials, meaning they can be recycled almost endlessly, increasing demand will not be fed by recycling only – even at the highest rate – and primary raw materials production will always remain necessary to fill the demand gap.

Additionally, there will always be mineral raw materials that cannot be recycled, either because they are consumed in industrial or consumer use, or because processing results in them becoming an integral, inseparable part of a product.

In other cases, including uses of rare earth elements, materials are difficult to recover and recycle because they are only present in products in very small quantities. But frequently it is precisely these minerals that are essential to the new green materials, products and technologies society is demanding.

Another reason why recycling alone cannot supply the market is that as long as products are in use, they cannot be recycled. So primary production is required to meet demand. The only viable solution is a combined approach: fostering a circular economy while emphasising the importance of keeping raw material value chains in Europe.

COLLABORATING ON A FUTURE ‘MADE IN EUROPE’

The increased demand for mineral raw materials has raised concerns regarding security of supply – i.e. the availability and cost – of such materials. In times of increased international instability and uncertainty, a new global race for raw materials is emerging. In order to be able to build a future that is truly Made in Europe, we will inevitably need a lasting raw materials policy for the age of the revival in raw materials.

2019 will bring the departure of the United Kingdom from the European Union, elections to the European Parliament, and new political leadership of the European Commission. At the same time, megatrends such as the digital transformation, the transition to a low-carbon economy and the new consumer society will continue to change the continent.

Now is the right time to look at how stakeholders can come together to respond to this change in demand. Focused debate and innovation transfer expertise will be necessary to establish continuous dialogue between stakeholders along raw material value chains, in civil society and in academia.

More than ever, the world needs a strong, self-confident and united Europe as a driver of stability and prosperity. EUMICON therefore invites all stakeholders to work together to build a future that is ‘Made in Europe’.

The European Mineral Resources Confederation EUMICON is a platform for strategic discussion processes and technology transfer focused on mineral resources. The platform creates links between public entities and institutions, domestic and international interest groups, the mineral resources industry, and science and research. EUMICON addresses topics along the entire mineral resources value chain, from extraction, to treatment and refinement, to use in processing and production, all the way to recycling. EUMICON regards sustainable life-cycle management and the responsible use of resources and energy as key priorities.