

A close-up photograph of a hand with weathered, brown skin holding a clear, faceted mineral crystal. The hand is positioned over a large pile of dark, jagged coal. The background is dark, making the hand and the crystal stand out. The overall image conveys the theme of 'critical minerals' and their connection to 'electric vehicles' and 'global justice'.

CRITICAL MINERALS IN CONFLICT

AND ALTERNATIVES FOR GLOBAL JUSTICE
IN PUBLIC PROCUREMENT:
THE CASE OF ELECTRIC VEHICLES

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RAÚL VELASCO-FERNÁNDEZ AND ALFONS PÉREZ



Executive Summary



This report has collated information on those problems that may be raised by the massive expansion of electric vehicles, and it studies manners in which public bodies could minimize these latent issues. We have firstly examined the potential risks and socio-environmental impacts of the most relevant critical conflict minerals that are associated with electric vehicle production. We have then looked at how to approach these problems from an institutional standpoint, and have placed a specific emphasis on public procurement and preliminary market consultation. To this end, numerous workshops have been held with NGOs, social movements, public administration staff and trade unions, in order to study different viewpoints, strategies and difficulties when dealing with those problems associated with the mass diffusion of electric vehicles. In this executive summary we have gathered several of the most relevant results of the report, and we invite the reader to expand on them, in accordance with their interests, by reading the corresponding sections of the report's extended version.

1. The Electric Vehicle in the Context of European Decarbonisation

Problems such as climate change, peak oil or thousands of premature deaths due to air pollution in cities are accelerating plans to decarbonize the European economy in all its areas, and especially in that of transport. The European Union aims to reduce internal combustion vehicles by half by 2030 and to gradually eliminate them from cities by 2050. At a local level, Barcelona City Council has developed the Electric Mobility Strategy, which anticipates a 100% electric-powered municipal fleet by 2030, while that of public transport and taxis is to follow suit by 2040. Passenger cars and motorcycles are expected to reach 4% and 8% respectively in 2024, while their total numbers are reduced in a progressive manner.

2. Scope in Terms of Mineral Demands

In 2015, the International Organization of Motor Vehicle Manufacturers (OICA) estimated the global vehicle fleet to stand at 1.3 billion units. The motorization ratio (vehicles per 1,000 inhabitants) was 14 times higher in the EU-28 than in Africa, and 3 times higher than in Latin America. The sector has grown from 2005 to 2015 at an annual rate of 3.7%. The projection of this growth would lead to a global vehicle fleet of 2.3 billion units in 2030 and 4.6 billion by 2050. If we add to this figure the fact that renewal cycles are around 10-12 years, this would mean that before 2050, the production of over 6 billion new vehicles would be necessary.

The introduction of electric vehicles and the deployment of renewable energies is increasing the demand for materials that come with numerous associated socio-environmental risks and conflicts. According to the World Bank, it is expected that by the year 2050 the demand for lithium (965%), cobalt (585%), graphite (383%) and nickel (209%), among others will increase significantly. Some studies indicate that in certain modelled scenarios there are insufficient reserves of some of the critical minerals mentioned above for the transition to be made.

3. Critical Minerals in Conflict

Batteries represent one of the most critical components of electric vehicles, as they depend on some of the most toxic metals and materials in the industrial supply chain (lead, sulphuric acid, mercury, manganese, zinc, steel, coal, graphite, ammonium chloride, potassium hydroxide, cadmium, lithium, nickel, cobalt and rare earths). Given the current situation, problematic activities are forecast to increase; these include mining, refining and those recycling industries with high energy consumption, and those actions that have serious impacts on the health of the workforce and those people living in proximity to these processes.

The most relevant critical conflict minerals for the manufacture of electric vehicles are lithium, nickel, cobalt, graphite, manganese and rare earths. The following table summarizes their main characteristics:

Table I. Main characteristics of key critical minerals in conflict associated with the manufacture of electric vehicles.

	Lithium	Cobalt	Nickel
Extraction (2019)	Australia 52% and Chile 22%	DR Congo 68%	Indonesia 33%, Philippines 12% and Russia 10%
Reserves (extraction currently viable)	Chile 44% and Australia 22%	DR Congo 50% Australia 20%	Indonesia 23%, Australia 21% and Brazil 17%
Resources (evaluation with geoscientific models)	Bolivia 33%, Argentina 30% and Chile 15%	DR Congo, Zambia, Australia, Cuba (no data available)	General data: 300 million tons
Final Use	Batteries	Batteries	Stainless steel and batteries
Environmental Pressure	<ul style="list-style-type: none"> › From 2 to 27kg CO2 per kg of lithium. › High water consumption 	<ul style="list-style-type: none"> › 1.45 and 10 Kg CO2 per kg of cobalt › Contaminates aquifers. › May be found with lead, cadmium, arsenic or uranium. › Toxic for animals and plants in high concentrations. 	<ul style="list-style-type: none"> › 5.25 and 10 Kg CO2 per kg of nickel › Sulphur dioxide emissions › Contaminates aquifers › Extraction in areas of high concentrations of biodiversity › Acid mine drainage
Health and Labour Conditions	<ul style="list-style-type: none"> › Continued exposure - negative health consequences. Skin burns in evaporation pools 	<ul style="list-style-type: none"> › Child labour Informal mining › Damage to children's DNA and risk of congenital defects › Dermatitis 	<ul style="list-style-type: none"> › Acid rain › Deadly in high concentrations › Low concentrations: respiratory, visual problems, asthma.

	Manganese	Graphite	Rare Earths
Extraction (2019)	South Africa 30% Australia 16% Gabon 13%	China 64%, Mozambique 10% and Brazil 10%	China 60%, USA 13%, Myanmar 11%
Reserves (extraction currently viable)	South Africa 40%, Brazil 20%. Australia 17%	Turkey 30%, China 24% and Brazil 24%	China 38%, Vietnam 19%, Brazil 18%
Resources (evaluation with geoscientific models)	South Africa 74%, Ukraine 10%	General data: 800 million tons	Abundant but at low concentrations
Final Use	Steel and batteries	Kilns, lubricants and batteries	Electric motors, permanent magnets and rechargeable batteries for hybrid and electric cars, wind turbines
Environmental Pressure	<ul style="list-style-type: none"> › 6 Kg CO2 per kg of manganese › May release radioactive substances and be toxic to plants and animals 	<ul style="list-style-type: none"> › 1 and 4.4 Kg CO2 per kg of graphite › Dispersion of acidic dust from refinement may contaminate water 	<ul style="list-style-type: none"> › High concentrations of radioactive elements such as uranium or thorium › High level of water, energy and chemical consumption
Health and Labour Conditions	<ul style="list-style-type: none"> › Overexposure may cause Parkinson's disease. › Workers affected by radioactivity 	<ul style="list-style-type: none"> › Dust may cause serious health problems, such as heart attacks and respiratory diseases. › Informal mining 	<ul style="list-style-type: none"> › Workers exposed to radioactivity

4. Socio-environmental Conflicts Associated with Critical Minerals

Even now, conflicts are currently being waged that are related to the critical raw materials needed for electric vehicles. These range from the struggle of the workers at the Bouazar cobalt mine in Morocco, who have reported working conditions akin to those of slavery, to the pollution of the water and ecosystems of the Glencore-Katanga mines in the Congo, an activity coupled with threats and violence against activists. Other serious current conflicts are the acid rain and sulphur dioxide emissions caused by Glencore's nickel mining in Zambia, the struggles of the Karonsi'e Dongi indigenous people against the mining company Vale, S.A., in Indonesia, and the open conflict for lithium resources in the salt desert of Uyuni, Bolivia, with a hard struggle between extraction activities, those seeking to protect water resources and the tourism that benefits local populations. In China, conflicts have arisen related to rare earth deposits. Extraction processes are concentrated in Bayan Obo, under the administration of Baotou city (west of Inner Mongolia) where local inhabitants have reported the massive contamination of soil and water, as well as the poisoning of animals and humans.

Many of these materials are found in high concentrations in impoverished countries with marked socio-environmental conflicts. In 2020, the Environmental Justice Atlas (EJAtlas) reported on over 2,700 socio-environmental conflicts worldwide, of which more than 570 were related to mining. In fact, in 21% of all those cases reported, mining represents the main source of socio-environmental conflicts in the world, followed by those conflicts associated with energy and climate (17%), biomass and land use (15%) and water management (14%). In 2019, it was estimated that 212 activists were assassinated. Fifty of these murders were directly linked to mining activities. Unfortunately, this is not a one-off case, but rather a long-standing dynamic and that has caused some 1,500 deaths over the last 15 years, 230 of these being in the mining and agricultural sectors.

5. Does Decarbonisation mean Greater Energy Security?

The promotion of renewable energies and electric vehicles is also normally related to security, as we are told that thanks to such a transition, our energy dependence on countries such as Russia, Saudi Arabia and Iran will be reduced. However, the extraction of minerals necessary for the transition to renewables and electric vehicles is also held by a mere few, and these minerals are in countries outside the European Union (Chile, Indonesia, the Democratic Republic

of the Congo, China and Australia). Furthermore, China not only concentrates most of the processing of these materials in its own territory, it also controls their extraction through the presence of its capital in a large number of extraction companies in third countries.

6. So, wouldn't it be better to keep going with Combustion Vehicles?

The problems related to electric vehicles should not distract us from the severe negative impacts of combustion vehicles. Although the production of the latter involves the use of few critical materials, it still remains intensive in terms of other materials, such as aluminium, iron and steel. The biggest impacts of combustion vehicles are associated with the massive burning of petroleum-sourced fuels, given that practically half of the oil extracted in the world is used for road transport. This factor must be added to the accumulation of power that is today wielded by the large automotive companies, and whose concentrated possession of a large number of patents have led them to dominate world combustion vehicle production (not to mention the concentration of power with respect to extraction, refining and distribution companies). Other important impacts may be found in the wars waged for the control of oil fields, the degradation of air quality, climate change and the spilling of millions of tons of crude oil into aquatic ecosystems.

7. From Vehicles to Mobility: Tools to rethink the Debate

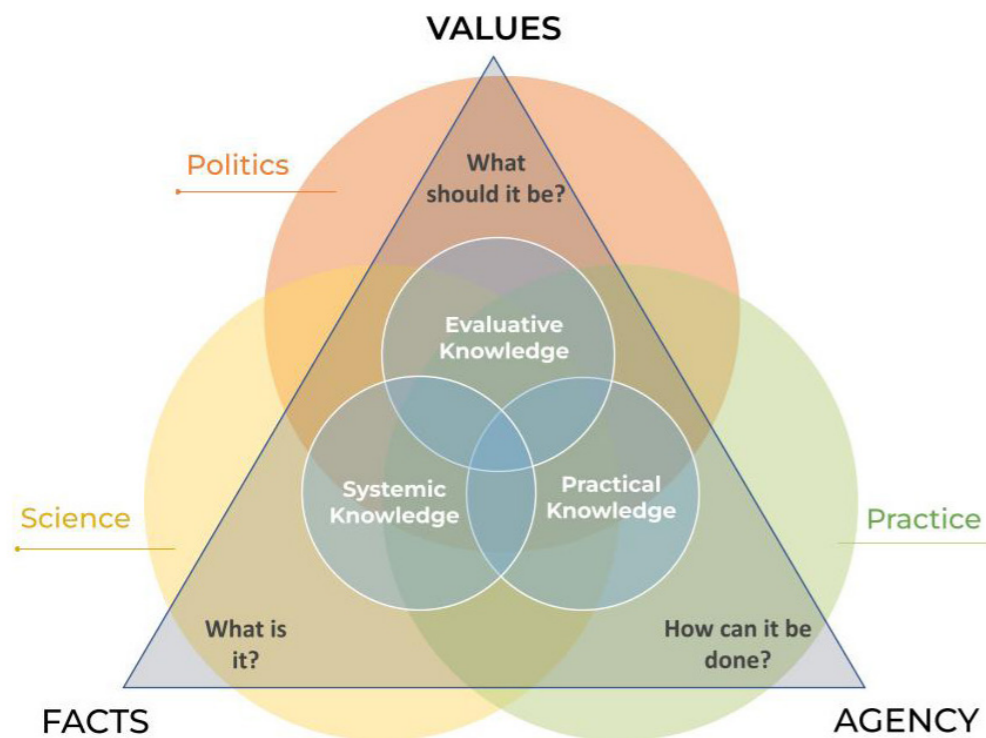
The OR+ JUST campaign has organized a networking space that focuses on public procurement and critical conflict minerals. In the use of this network, a previous analysis is reinforced by a participatory process that seeks to nurture types of knowledge and evaluation languages that go beyond those of the report's authors. This practice also seeks coherence with the principles of pluralism within the concept of global justice, and it contributes to building a community that facilitates this process by debating the criteria for public procurement. These are issues that should be taken into account by Barcelona City Council if this body seeks to be consistent in its actions to promote public benefits beyond its city limits. In order to raise these two points, the value of the plurality of knowledge must first be recognised in order to initiate determined actions that allow the coherence and effectiveness of public policies to improve, and to critically analyse those benefits that arise (in terms of sustainability) through the use of electric vehicles.

8. Plural Knowledge: Science, Practice and Politics

Transdisciplinary research underlines the importance of supplementing scientific knowledge with other types of understanding, such as practical or political information, while designing research questions and transformative actions. This is due to the idea that in order to carry out systemic transformations that go beyond a technological conversion (changing mobility and not just a vehicle engine), one must not only take into account the different types of scientific knowledge that make this possible, but also the organisation of those societal values in which the changes are to occur, as well as those institutional transformations required to accommodate the new technology.

In this respect we can identify three types of questions concerning electric vehicles that these additional forms of knowledge would answer:

Figure I. Areas and types of knowledge to be considered for a lasting social transformation.



1. How does electric vehicle deployment relate to issues of global justice and sustainability? (knowledge of systems, knowledge of causality and their interlinkages, science).

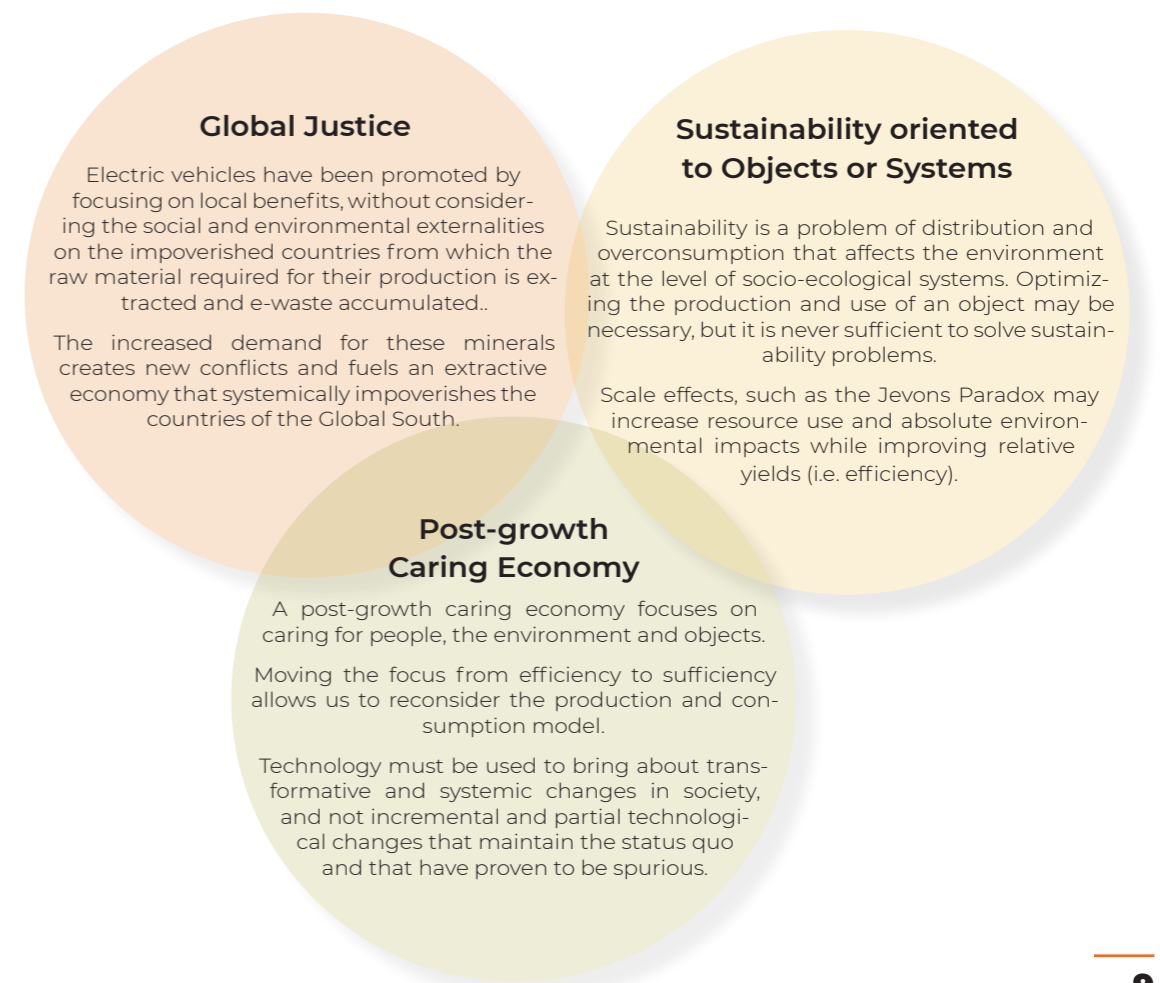
- 2. How can we ensure that electric vehicle deployment contributes to improving aspects of global justice and sustainability? (practical knowledge, knowledge of how to undertake specific transformations, practice).
- 3. What does it mean to contribute to improving aspects of global justice and sustainability? (political and evaluative knowledge, visions and narratives regarding desirable futures).

9. Overcoming Viewpoints that focus on Technology and Growth

Overcoming policies that focus on technology and growth requires the mobilization of new visions. The diagram below summarizes different critical views that would help to make this change.

Figure II. Key messages from critical visions to guide policy action on critical minerals in conflict.

CRITICAL VISIONS TO GUIDE ACTION TOWARDS SUSTAINABILITY



The move from fossil fuel use to renewable energy sources involves slowing down the pace of both society and the economic process. In this conceptual model, the electric vehicle as a private car would become a luxury, and one difficult for the majority to socialize, unless shared private vehicle use becomes a dominant trend, with private vehicle ownership remaining solely as a residual phenomenon. Electric vehicles face the challenge of both transforming engine technology and the advancement towards technologies, institutions and social practices that allow and facilitate increased vehicle use (a normal vehicle spends an average of 97% of the time parked), its level of use (1.2 people per vehicle, on average) and its durability (currently over 14 years in Spain as a whole). In institutional terms, this would involve moving from a private and single-model format that is habitually employed to move a single person from door to door, to a public-community and multi-modal format that merges with other transport mode, with vehicles shared among numerous people. Furthermore, it would be necessary to incentivize and legislate in order to promote repairs and to extend vehicle duration, without compromising public safety, by introducing technological improvements in a modular way, and in a manner that minimises the need to transform new materials. However, the climate emergency context requires moving beyond a vision that focuses on the vehicle, or its usage practices. In this respect the need to travel should be reduced and the urban planning model needs to be reconsidered by halting the expansion of dispersed, purely-residential developments that involve immense dependence on private vehicles and make it difficult to use both public and shared transport means.

10. Due Diligence on Global Supply Chains

Due diligence on all purchases made by public administration bodies is required by law, although mechanisms to make this effective are lacking. Article 201 of the Public Sector Contracts Law (below) establishes this obligation for organisations in public administration:

The contracting entities will adopt relevant measures to ensure that in the execution of the contracts, the contractors fulfil those obligations applicable in environmental, social or labour-related matters, as established in the law of the European Union, national law, collective agreements or by the provisions of international environmental, social and labour-related law that bind the state, and in particular those established in Annex V.

That indicated in the paragraph above is established, notwithstanding the power of the contracting authorities to adopt appropriate measures to verify, during the bidding procedure, that the candidates and bidders comply with the obligations referred to in the aforementioned paragraph.

Failure to comply with the obligations referred to in the first paragraph and, in particular, failure to comply or repeated delays with respect to the payment of wages or the application of wage conditions lower than those derived from collective agreements that is serious and wilful, will result in the imposition of those penalties referred to in Article 192.

Article 201, Law 9/2017, BOE (Official State Gazette) 272, 9 November 2017

11. Tools for Advocacy with Respect to Public Procurement: Participatory Preliminary Market Consultations

Public procurement represents almost 20% of GDP in Spain. This value may even increase through the marked public investments that are being associated with the economic COVID recovery plans in Europe. These plans are being implemented through European Green Deal funds, where the promotion of electric vehicles plays a key role. The purchasing power that civil society delegates to states represents a significant counter-force to that of transnational corporations in a context of economic globalization where: (i) regulations on labour, social and environmental rights are significantly different between states, although these trade intensively, and many of them do so practically without tariff barriers; (ii) international regulations, such as trade and investment agreements are clearly favourable to large transnational corporations, (iii) companies are relocating their production activities to those places where labour, social and environmental rights are less protected, as these involve large cost savings, a fact that implies systemic downward pressure on these rights, (iv) the bargaining power of the working class and local communities is typically lower than that of large transnational corporations. However, the quality criteria used by states in public procurement (including price) are disputed. Influencing public purchasing policies therefore represents an important tool for change.

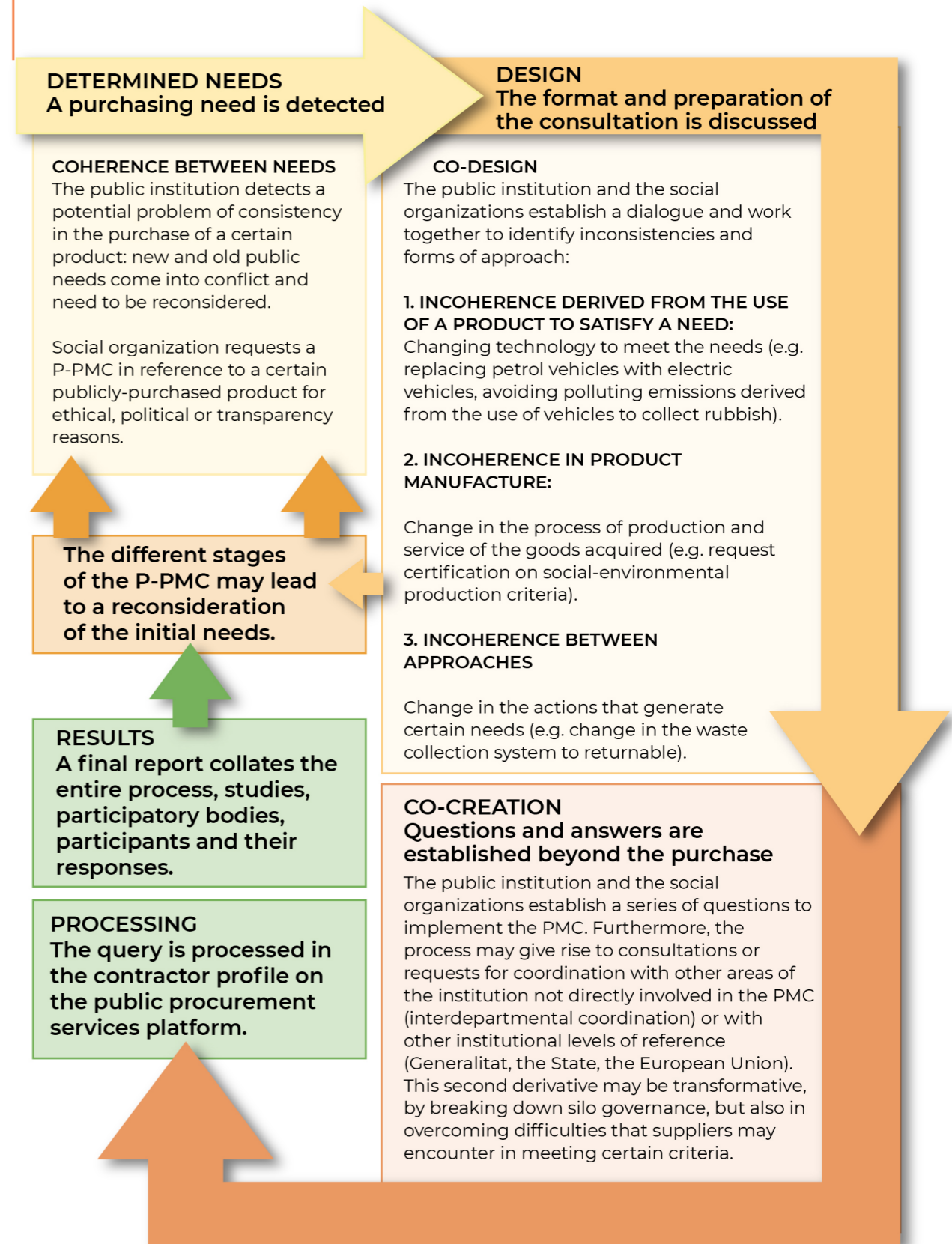
In recent times, several public institutions, such as the European Commission, the Catalan Government and Barcelona City Council, have been promoting Preliminary Market Consultations (PMC). This consultation process may well become a new advocacy tool in the context of the public procurement we have explored in participatory workshops concerning electric vehicles as well as in institutions such as Barcelona City Council.

The Catalan Government defines a PMC as: “a market research tool in the framework of the preparation of a future tender, which allows contracting bodies to promote an open and transparent technical dialogue with the relevant private sector, in accordance with the needs to be covered.” These consultations are recommended when: (i) the contracting body does not know enough about the scope of the contract to be tendered; or (ii) it wants to discover if the market has, or may have new or different solutions to cover its needs. However, a PMC becomes an essential instrument when a contracting body detects new needs that require innovation from the market. In this respect, the public sector buyer needs to attain both technical and specific knowledge of the market that they would otherwise tend to be unaware of, given that this knowledge came from the day-to-day management of the services.

PMCs however may be used to guide the innovations of public providers towards transformations with new objectives (such as, for example, changes in the ways they deliver services that go beyond technology, or social and environmental guarantees related to the supply chain). Furthermore, by making PMCs participatory, not only is transparency in public procurement improved, public knowledge regarding those specific problems that hinder change is also enhanced. The participation of social movements in these processes is essential to the presentation of those aspects of global justice that need to be considered, and to identify those bottlenecks that may hinder the systemic changes required to tackle the climate emergency and other serious socio-environmental problems.

Opening a PMC to inputs from the public and social organizations could improve both the transparency of institutions and the coherence of their policies. A Participatory Preliminary Market Consultation (P-PMC) would include new aspects, as shown below:

Figure III. Main parts of a Participatory Preliminary Market Consultation (P-PMC).



12. Participatory Workshops

The participatory workshops have shown that the PMC concept when applied as an instrument of the administrative government is still a procedure largely unknown within the administrative system itself, and one that is totally unknown to those other actors who have taken part in these events. Participating NGOs and social movements have pointed out that the P-PMC could be an interesting advocacy tool for public procurement and the innovation focus of companies, although there is also some mistrust regarding the participatory mechanisms implemented by administrative bodies. Those responsible for processing public purchases have identified three basic problems in the use of PMCs and public procurement so as to improve labour-related, social and environmental conditions in supply chains: (i) the difficulty of getting companies to participate in PMCs; (ii) the lack of reliable certification instruments regarding these aspects, (iii) the lack of resources to effectively monitor the tenders, and (iv) the limited power of influence following the purchase, when the product acquired is produced by only a few companies, or when the purchase volume is small. With regard to the unions, they perceive inconsistencies in the basic issues involved in the subcontracting of public services by administrative bodies that would be easy to correct, as shown by agreements made with the Catalan Government. Furthermore, members of the Spanish trade union *Comisiones Obreras* endorse the work that unions undertake at an international level to improve working conditions in supply chains, with mechanisms such as the Global Framework Agreements, while citing their representative legitimacy; given that they are elected as workers' representatives both legally and democratically. Lastly, this process has also enabled us to learn at first-hand the future visions of the most political actors (unions, social movements and NGOs) and to identify bottlenecks within administrative organisations, where people see those suggestions focused on systemic changes as something of a utopian fantasy.



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