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THE NEW SOCIAL CONTRACT: A JUST TRANSITION



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Foreword

Solidarity and trust are key values of the Energy Union and are essential in addressing climate change in a just manner. That is because while the transition to a low-carbon economy is a collective challenge, it also has a great potential for creating new jobs, enticing innovation and generating growth. The idea of a 'Just Transition' is an important element if we want to succeed in moving away from fossil fuels whilst investing in the clean and innovative technologies that create sustainable jobs and regional development.

In order to exploit this potential and ensure that everyone is part of this transition, we need close cooperation between institutions and citizens, regions, cities, workers and companies. A low-carbon economy must also mean a secure and inclusive economy. What's more, in order for climate action and energy policy to be effective, they must be prescribed in coordination with a wide range of other policy areas. This requires considerable engagement, institutional coordination and alignment. We need ownership and engagement of the entire society for this transition.

Therefore I welcome the FEPS and Change Partnership's initiative and hope that it can showcase and reinforce the momentum towards achieving our common goals. Learning from past experiences, we can promote best practices to help other regions transcend change successfully.

I look forward to working and discussing with stakeholders in the coming months how we can collectively make a Just Transition a European reality.

Maroš Šefčovič
European Commission Vice-President for Energy Union
28th September 2016

Executive summary

COP21 in Paris committed world leaders to a new deal in ending the use of fossil fuels and limiting global temperatures to below 1.5 degrees. This requires a substantial reorganisation and direction of numerous policies to aiding the required transition in key countries, regions, communities and business models.

The pace of change and ensuing uncertainty is likely to heighten tension among stakeholders which have to transition the most and those fearful that disruption will lead to a loss of their livelihoods. The perception of this loss is as potent as any physical manifestation of loss. Whether in the end it turns out to be false or not, the perception of loss will be a powerful factor shaping political decisions and the pace of change. To overcome these fears emphasis needs to shift away from just counting tonnes of CO₂ reduced, the foundation of conventional climate policy, towards building new, inclusive, fair and clean regions based upon local stakeholder participation. This is, in essence, the basis for regional policy a **new societal contract, taking into account, social justice, fairness and the right to human dignity as the reason for a fair, inclusive and Just Transition.**

The EU was founded on the coal and steel sectors. Both have to undergo substantial transformation to fit into the world outlined in the Paris Agreement. Past transitions in these sectors, with a few notable exceptions, have often left a painful legacy which cannot be repeated if humanity is to decarbonise. Rather than setting frameworks and hoping for the best, a new approach to policy making is required of which the core foundations are new models of ownership, accountability, management and delivery, which is in the interests of citizens, workers, communities and future generations, need to be institutionalised throughout Europe's regions, national and supranational governments.

In this study, we examine three case studies of the coal and steel sectors from North Rhine Westphalia in Germany, the UK and Bilbao in the Basque region of Spain. These regional transitions are important because change change will impact on these regions either directly through environmental catastrophe or evolving socio-economic models. Each story highlights marked differences in the approach, ownership and legacy of regional rejuvenation. Each region's approach gives powerful insights on the need to realign EU, national and regional transition policy, the Multiannual Financial Framework, regional policy, the Covenant of Mayors, clean energy and climate policy to empower leaders.

The core issues we examine are:

1. Models to organise change at a regional, national and EU level
2. Means to finance transition
3. How to ensure delivery of key outcomes.

Our aim is to outline an integrated and effective policy architecture based on transparent structures of political accountability, which incorporate inclusive visions of regional regeneration and investment. This is the essence of a **fair, inclusive and just transition; A New Social Contract.**

A photograph of several wind turbines against a dramatic, colorful sky at sunset or sunrise. The sky transitions from deep red and orange on the left to a dark blue on the right. The turbines are silhouetted against the bright light of the sun, which is partially obscured by clouds. The overall mood is serene yet powerful, symbolizing clean energy and environmental stewardship.

Part I

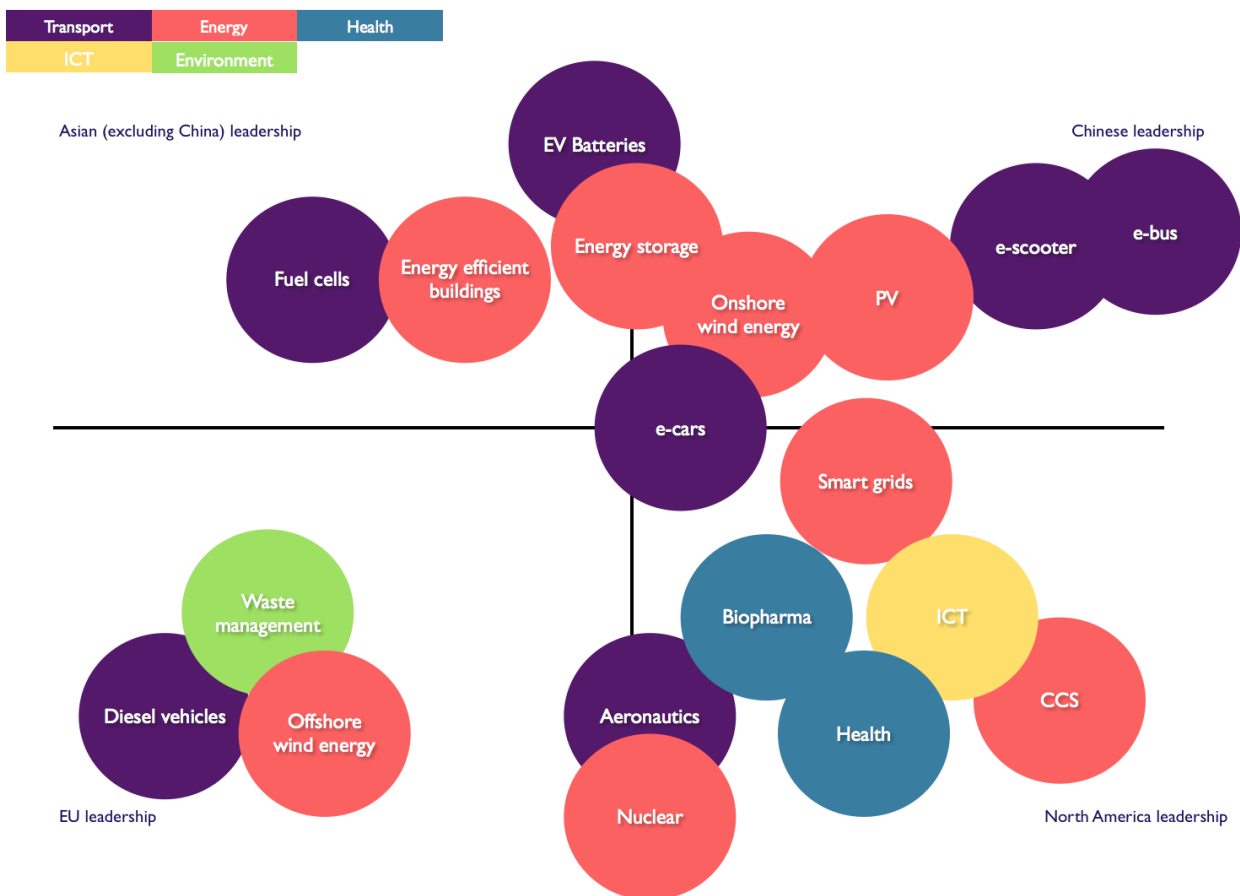
The politics of climate change

The real impact of climate change

The Paris Agreement would not have come about had it not been for the EU's tireless 20 year diplomatic effort. Over that period, global emissions have continued to rise and the window to stabilise and reduce global temperatures is closing fast. The European Commission concludes that climate change will have substantial direct and indirect impacts. Southern and central Europe expect to see more frequent heat waves, forest fires and droughts whilst the likelihood of drought and wildfire will increase in the Mediterranean area. Northern Europe will get wetter with increased occurrence of winter flooding. Urban areas are not prepared to adapt to climate change and will be exposed to more heat waves, flooding and economic losses. Over €90 billion losses were experienced by climate change related floods between 1980-2011. Important industries such as agriculture, tourism, energy and forestry at high risk of disruption and economic losses.¹

However, it is a mistake to see climate change only as an environmental issue. Combatting climate change is the key opportunity to reposition economies and maximise new wealth. Already, many of the EU's key competitor nations have invested heavily and captured lucrative clean technology sectors as outlined in Figure 1.

Figure 1: Clean technology research and deployment matrix



Source: Change Partnership²

Much of these technologies are the source of tomorrow's economic growth, jobs and wealth. If the EU does not act quickly it will soon find its main source of peace, stability and prosperity undermined as wealth and future growth is drawn to economies with increasingly clean energy and transport systems with far less geopolitical risk than those based on imported fossil fuels.



The future of our cities, regions and generations to come depend upon timely action to address climate change. Real action is required at a much greater and more profound level than that undertaken over the last 20 years in the EU. This means getting to grips with the politics of climate change, in particular changing the nature of the policy conversation so that action to decarbonise the economy within the next three decades is achieved in a socially and politically acceptable way. This is the reason why a new social contract is required that supports those required to transition the most whilst ensuring that the EU builds and maximises the opportunities from clean energy, transport and economic systems.

With this publication we hope to set out how Just Transition can become a reality.

The new social contract

Climate change science has not induced the adequate policy responses because the core fundamentals of a deal between the fossil fuel interests and the rest of society have yet to be agreed. As stated earlier, this is because climate change is not just an environment issue but requires a profound rewrite of global socio-economic structures especially from fossil fuel interests, which are the most powerful today. These interests have enticed invasions of countries to exploit their petroleum assets, undermined the scientific community by fuelling climate sceptics, embedded themselves in political establishments and generated the wealth upon which many nations are based. Given the limited window of action to stay within the bounds of the 1.5 degrees temperature rise, it is essential that action is taken much quicker and more profound results delivered. Our analysis of three major industrial and fossil fuel regions is that once the transition period started, it took about 20 years to transform the majority of towns and cities.

For climate change to be successful, this fossil fuel architecture needs to be deconstructed and either replaced by clean and sustainable interests or reconstructed into them. This is the case for a new social contract in which the clean and sustainable socio-economic structure is built whilst catering for climate polluting interests. The closest example of this kind can be found in the case of ending the slave trade in the UK during the 19th century. After 80 years of campaigning, the UK finally agreed to end slavery by paying out plantation owners £20 million in government bonds in 1833, which was about 40% of the government's

budget then or £2.2 billion in today's money, according to the historian Adam Hochschild.³ There simply isn't enough money to buy out all fossil fuel interests today. *Policy is therefore essential to bring down these costs to society, which will also have to pay for the costs of climate change impacts.* This is why a new social contract is required. It represents an opportunity to transition in a orderly manner.

The politics of climate change

At first glance, a new social contract may seem to be unnecessary. After all, many governments around the world have, to varying degrees of success, introduced measures to increase the uptake of clean energy capacity through renewable energy support schemes, feed-in-tariffs or purchasing agencies as well as promoting energy savings. Some have been driven by the need to address climate change but mainly it has been viewed as an opportunity to capture lucrative clean technology sectors, their associated employment, research potentials and introduce modern lifestyles.

The Global Climate Legislation Study 2015 highlighted that by the first of January 2015, 99 countries had some form of climate legislation covering 93% of global emissions.⁴ The World Bank identifies 39 national and 23 sub-national jurisdictions have placed a price of greenhouse gas emissions either through market-based measures or taxation.⁵ It would appear the foundations to address climate change are in place. The problem is that some of the leading proponents of action on climate change are also the biggest financers of fossil fuels. For example, governments play the critical role in enabling oil exploration and extraction by granting licenses and then subsidising returns. The Overseas Development Institute (ODI) and Oil Change International highlighted France, Germany, Italy and the UK with \$42 million, \$344 million, \$407 million and \$1,174 million subsidies respectively for petroleum exploration and extraction in 2014.⁶ Germany, one of the 'green' champions in Europe is also one of the largest subsidisers of domestic coal production spending up to €3 billion per year to keep its coal costs cheaper than international competitors.⁷ These hard coal plants are due to be phased out by 2018 whilst lignite mining experiences a boom in the country. Another example centres on the rise of Capacity Markets - compensatory payments to fossil fuel-based electricity producers for falling revenue streams - which undermines the EU's core objective of putting a carbon price on the most polluting means of electricity generation.

Part of the EU's policy problem is the fixation with counting tonnes of CO₂ emissions reduced. At first sight, this appears to be the right course of action considering climate change is about the stock of greenhouse gas emissions in the atmosphere. The drawback to this approach is that it pits 'investment grade'⁸ clean technology policy against accounting tricks and loopholes, an example of which is upcoming legislation for Land Use, Land-Use Change and Forestry (LULUCF). This allows governments to emission reductions on paper rather than actually investing in improving energy savings from housing or electric vehicles in the transport sector. Regulation tends to be dictated by Goodhart's Law, which suggests that when economic measures become the subject of legislation, its measurement accuracy is eroded by strategic manipulation.

The EU's flagship policy was the Emissions Trading System (EU ETS), a market based approach to incentivising emission reductions. It has failed to be able to shift any substantial investments in energy or manufacturing industry for over ten years. Yet unfortunately, investment-friendly policies such as those for renewable energy deployment are cut to shreds for ideological and political reasons. Without the new social contract, it is unlikely that the EU will meet its Paris Agreement obligations or remain competitive and relevant.

The three pillars of the new social contract

We consider a new social contract to be based on three reinforcing pillars:

- a) Rapid delivery of clean energy, transport and manufacturing technologies. This is the source of sustainable growth, employment and prosperity and de-risking the economy from the destabilising impacts of dependence on fossil fuel imports. This requires clean technology deployment and innovation support to 2050. Where fossil fuels remain, abatement solutions namely carbon capture

and storage (CCS), should be delivered. Much of this will be in the realm of regional and local authorities and covered by Sustainable Energy and Climate Action Plans (SECAPS) or their equivalent regional investment plan.

- b) Removing fossil fuel capacity in a socially and economically satisfactory way. This involves aiding regions dominated by a single or cluster of polluting capacity transitioning to a sustainable socio-economic model. It requires specific support for workers, communities and regions to reposition themselves. It also requires a supranational approach to exit or abate fossil fuel producing activities. Because of its implications for the internal market and EU policy, this is a shared competence between the European Commission and Member States.
- c) A shared management platform tasked with overseeing both these objectives. The EU governance criteria, provided it enables systemic transitions to be measured, will be a useful guide. Here, there is a role for European Parliament, Commission, Committee of the Regions and Council to share governance, results and identify additional measures to support transition.

Just Transition is a key part of this equation. It stipulates that workers and communities are involved in the transition through a '*social dialogue*', a formal process of engagement with workers, which Dan Cunniah, Director of the Bureau for Workers Activities at the International Labour Organisation, states it as the best means for sound economic management of the economy.⁹ The main asks from the just transition are engagement with workers, creating clean and sustainable employment; training, access to decent employment and support for those most vulnerable to change such as workers close to retirement, etc.¹⁰

A social dialogue is already programmed into the EU's governance structure and managed by DG Employment, Social Affairs and Inclusion. Each sector has a dialogue space for discussion, consultation, negotiation and possible joint action. Triparty discussions with the European Commission are also organised. It could be a venue to look into socio-economic restructuring required but does not have access to policy making nor participation of many other stakeholders essential for an inclusive and relevant debate.

Housing the new social contract dialogue

A new forum to house an EU-wide dialogue for change is required which brings together key representatives from across the EU economy. Change Partnership first outlined these ideas at the Electricity Sector Social Dialogue on 13 May, 2015 and recommended a Just Transition Fund should be established to add real gravity for effective decision-making.¹¹ The preferred model is the use the former European Climate Change Programme¹² bringing together key stakeholders from the European Commission, Member States, industry, workers and civil society. We suggest extending participation to include regional and local government representatives to ensure there is a full debate and a commitment to the policies that flow from this process. The notion that these discussions are about real policy design, implementation and use of Just Transition Fund revenue will give them added stature and momentum for change.

Without this institutional space for debate, the core politics of climate change blockages will not be overcome, thus preventing an adequate response to our challenges.



Part II

Transition in action

Three examples of transition in action

The challenge of economic restructuring during the 1970s and 1980s in response to shocks in the global supply of oil and changing trade patterns was successfully addressed by many European countries. This led to many industrial sectors downsizing and the removal of national subsidies which were used to prop up declining industries. Within regions, however, something innovative, experimental and bold was unfolding which gives a clear insight into how socio-economic reorganisation can occur to deliver a Europe compatible with the Paris Agreement.

We examine three examples of transition in industrial and coal-based regions - North Rhine-Westphalia in Germany, coal mining in the UK and Bilbao in the Basque region of Spain. Each story exhibits marked differences in the approach, ownership and legacy which aid construction of general model for implementing a just transition across other regions dominated by a single or a cluster of greenhouse gas polluting economic activities. All three examples highlight the following traits:

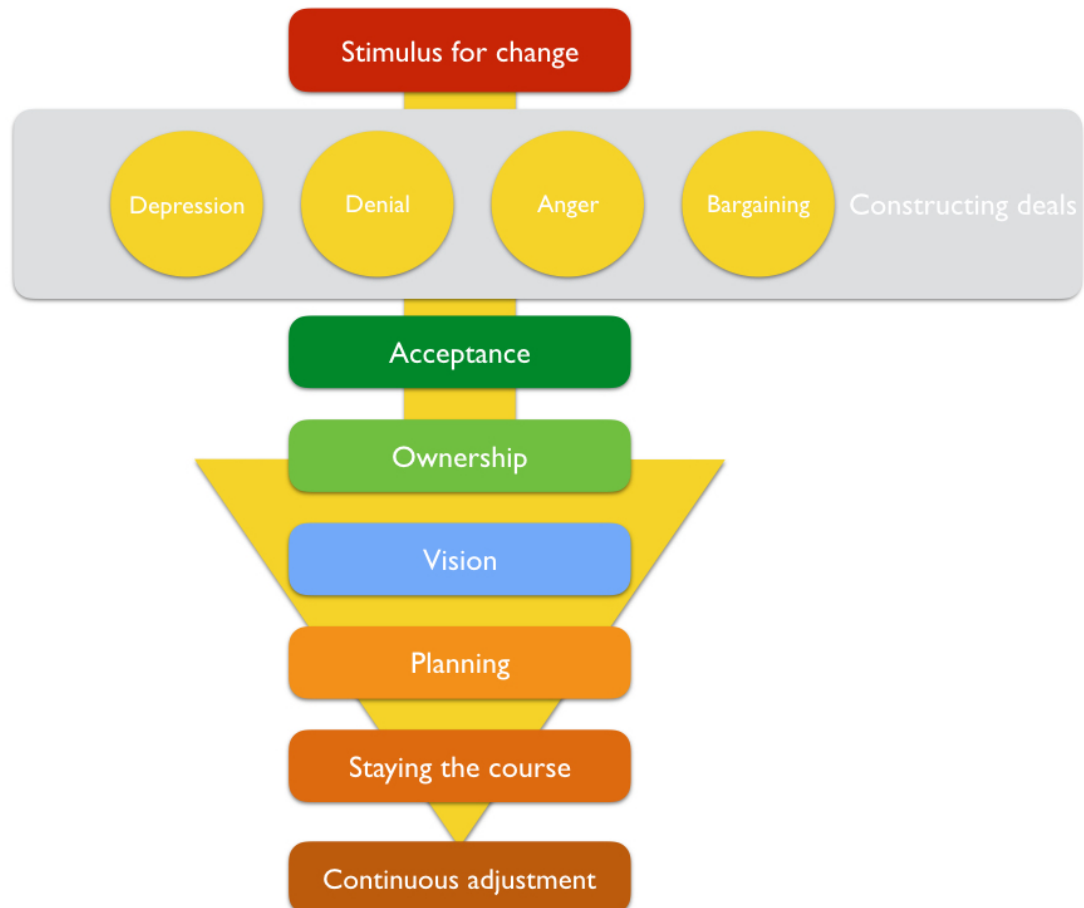
Element	Overview
Response to a stimulus ending the status quo	In each case, the regional government responded to a major shock such as the planned closure of industrial capacity, changing trade patterns or a major environmental catastrophe.
Ownership	Local government leaders took ownership of the need to rejuvenate their regions. In many instances, the change programmes were depoliticised to maximise delivery.
Organisation	Entities were established to manage the delivery of investments and in some instances raise finance.
Finance	Finance was raised through local initiatives, public-private partnerships and the use of EU structural and cohesion funding.
Time	Transformation, happened very quickly but remained an ongoing process.
Bold visions of the future	Each region used the crisis to reposition their cities/regions/towns in an attempt to capture new and emerging markets as well as investing in critical enabling infrastructure to benefit future generations.
Experimentation	A vast array of socio-economic activities were supported to give the region strength through diverse business models.
Pride	The strong local identity and sense of pride was maintained and built upon.
Limitations	Local and regional governments had limitations on the actions they could perform such as negotiating the closure of capacity or retirement schemes with workers, all of which were the role of the national government within the parameters laid out by the EU.

North Rhine-Westphalia, was referred to as the land of coal and steel (*Land von Kohle und Stahl*). It was selected because of its economic significance to the German economy - it is the richest *Lande* contributing more than 20% to national GDP - as well as the diversity of experimentation in its approach to regional regeneration. The decline of coal mining in the UK was selected because of its brutal break with the past and central government which led to significant bottom-up action. Today's picturesque city of Bilbao was able to cast off its ugly, dirty and very polluted image within a generation by building a firm vision of change and a strong political will to radically break with the past.

Each of these histories, although subject to unique circumstances with respect to timing, location, political systems, geographical size, people on all sides of the debate, etc; do follow a distinct pattern which helps to inform policy making. This pattern mirrors the five, non-linear, dimensions of psychological response to bereavement or intense shock - Denial; Anger; Bargaining; Depression and Acceptance - outlined by Kubler-

Ross in her seminal work on death.¹³ Combining these with the three transition stories, Change Partnership has developed a model, see Figure 2, outlining the key stages of deep transition to enable better understanding of regional regeneration and effective policy design.

Figure 2: Transition model



The long and winding road: Hard coal industry in North Rhine-Westphalia

Transition in North Rhine-Westphalia was driven by a significant crisis of economics in the German hard coal industry and the need to end its subsidy burden. The collapse of coal and steel drove the North Rhine-Westphalia government into a series of innovative and experimental investments in infrastructure and services in an attempt to inject new life into new towns which had germinated from countless local coalfields and cheap energy.¹⁴ The crisis also forced the State and Federal governments to make a deal with coal workers for a slow transition to downsizing production capacity and the workforce to ward of the potential for serious industrial strife and economic decline in the region. Yet even after all this transition coupled with record installations of wind and solar energy, Germany still remains Europe's largest greenhouse gas emitter, the 7th largest global coal producing country, the world's largest lignite producer¹⁵ and the biggest greenhouse gas emitter in the EU.

The rise and hard fall of coal

Coal experienced a major boom post 1945 as the Allied powers commissioned the German Coal Control Body to sell them coal at below world prices. This bonanza ended in the 1950s ushering in the era of coal crisis. Production rose from 38.9 million tonnes (Mt) of hard coal in 1945 to more than 151 Mt in 1956.¹⁶ During this phase, coal production became essential for the reconstruction process and to comply with reparation payments.¹⁷ From 1958 onwards, the direction of hard coal production and policy changed. After the post-war boom, production inefficiencies and excessive costs made coal mining as well as other industries uneconomic. The depth of coal seams meant that German coal production was at an economic disadvantage to some hard coal producers from eastern Europe as well as global markets.

A deal had to be struck to maintain peace with workers and communities whilst rationalisation was pursued. For Germany, the deal was a gradual decline in coal mining employment at considerable financial subsidies from the state. All was not plain sailing though. On 10 March 1997, 20,000 coal miners marched to Bonn, where talks for an agreement with miners was scheduled for the following day, in order to lay siege to the Free Democrats Party, the junior member of Helmut Kohl's Federal coalition government, against a two-thirds cut in the annual subsidy (10 billion Deutsche Marks - (\$6.25 billion). SPD political leaders came in to move the miners away. In North Rhine-Westphalia and neighbouring Saarland roads, highways, canals and government buildings were blocked by miners. At the Thyssen steel plant in Duisburg, coal and steel miners joined forces to shut down the port, the largest industrial port of significant to all of German industry. This was a protest against the government's budget cutting proposals but highlighted the tension and industrial difficulties with respect to industrial reorganisation in fossil fuel regions. Ultimately, the Federal government conceded to the miners and agreed to scale down the plan to close down mines and stretch it out over time,¹⁸ a precursor to the *Hard Coal Financing Act* agreed in 2007.

Coal mining subsidies were the largest expenditure of the Federal government. The total amount of subsidies is estimated at \$538 billion between 1970 and 2014.¹⁹ In 1990, there were about 260,000 coal workers in the country and by 2007 this had fallen to 56,000.²⁰ €51.7 billion in subsidies was granted to maintain 38,500 coal-based jobs of which €34.9 billion covered operational losses. €12 billion additional subsidy was used to close down four mines.²¹ The *2007 Hard Coal Financing Act* heralded the socially acceptable end of subsidies by 2018 and the closure of remaining pits of which six were located in the Ruhr area and one in the Saar region. It took over 55 years for production to fall below 1945 levels. Between 1990 and 2013, total national coal production²² fell by 56%. Lignite production halved over this period whilst hard coal production collapsed by almost 90%.²³ Germany has now established the closure of all but one hard coal mine, which is scheduled to close in 2018. The mining workforce has declined from its peak of nearly 600,000 employees in 1950 to about 12,000 workers today.²⁴

Rejuvenating North Rhine-Westphalia

A large share of its own finances as well as those of the Federal government were invested in mining areas to ensure a socially acceptable phase-out of the hard coal industry.²⁵ However, managing this decline in the current workforce was one side of the equation for the North Rhine-Westphalia state government. It had to react quickly to rebuilding and remoulding its towns, cities and communities into a new identity, whilst maintaining intense regional pride and catering for future prosperity.²⁶ A major tranche of new investment came in the shape of universities and higher educational institutions, located in the heart of the Ruhr region which were essential to house future generations of citizens as well as the children of coal and steel workers. Previously, the four main closest universities were located in large cities of Bonn, Cologne, Münster and Aachen. The North Rhine-Westphalia government took the initiative to establish new Universities in the region. In the beginning they were more vocational. This was part of the 1950s to 1980s process which began rejuvenating the region and designing as well as implementing the 1968 *Development Programme* - an urban spatial planning programme focused on building educational establishments in the impoverished region - such as the Ruhr University in Bochum followed by the University of Dortmund in 1962, Düsseldorf University in 1965 and a cluster of universities and higher educational establishments in Wuppertal, Duisburg, Essen, Paderborn, etc, in 1972 - as well as critical infrastructure; improving road and rail links and revamping very polluted areas such as the 70 km Emscher waterway, which been an open sewer during the height of industrial activity, but is subject to a €4 billion reconstruction.²⁷

The creation of universities was the critical decision for the region's rejuvenation because it created the blueprint for investing in institutions that would engineer a new source of regional pride whilst providing a catalyst, (Professor Zöpel refers to this as an "agglomeration") for a new economic model able to tap into new economic activities centred on highly qualified personnel that could be employed in the service sector and in the new high tech industries. These new institutions greatly contributed to the restructuring of the Ruhr area, both in terms of social and economic regeneration.²⁸ The case of Dortmund, which has established itself as a technology hub, is a good example. The Technology Centre Dortmund has successfully developed a network that supports SMEs and startups enabling linkages between science and business.²⁹

Redeveloped Dusseldorf North



Industrial and business experimentation

The regional government, based on its strategic investment in educational excellence and coupled with funds from the EU, invested heavily in renewable energies. Between 1988-2007 about €700 million funds from the EU's European Regional Development Fund (ERDF) programme and the North Rhine-Westphalia state funding was spent on over 60,000 to develop and demonstrate innovative energy technologies and energy consulting, which generated a future €3.8 billion in commercial returns.³⁰ By 2009, around 24,100 employees in 3,400 companies worked in the renewables sector generating about €7 billion revenue.³¹ 7,000 employees bringing in about €3.2 billion returns worked in the region's wind energy sector.³² The investment made by the North Rhine-Westphalia government was starting to pay considerable dividends highlighting the ability to recast industry. However, the solar example provides a cautionary tale of jumping from a mono industrial sector to another. Gelsenkirchen-Herten, a municipality in the heart of the Ruhr region, was the epicentre of the solar manufacturing revolution. Due to low complexity in solar PV manufacturing, it is relatively easier for new entrants to enter the global market. Such was the case with Asian manufacturers who entered the market in around 2009 bringing down the cost of PV panels and with it many of the businesses based in the region.³³

The management services company PROSOZ, also located in Herten's industrial park is another example of the challenges that regional governments face when it comes to new economic models - keeping employment local. PROSOZ was born through Herten and Bremen local authorities coming together to create a company specialising in digitalising administration functions undertaken by municipal governments. From humble beginnings in 1984, it has gone on to establish itself as a market leader in local government administration and is under pressure to relocate away from Herten towards a larger city where it will be able to attract a more qualified workforce.³⁴

Today North Rhine-Westphalia is Germany's most populous and economically important *Lande* with GDP making up 21% of the country's total.³⁵ This is after the economy underwent a dramatic shift in the number of people employed in the services sector - 49% in 1980 to 76% today which make this once industrial heartland now a bastion of the services sector.³⁶ Interestingly healthcare is now the biggest and fastest growing sector in this region.

Turning a crisis into an opportunity: The birth of Bilbao chic

Bilbao can be viewed as one of the most successful cases of deep transition. From humble origins as a fishing village it was given the status of a town on 15 June 1300 by Diego López de Haro, Lord of Biscay, as well as the *fuero* - a traditional Basque legal system of statutes which give it the right to raise and spend its own taxes as well as regional autonomy.³⁷ Its people always had an outward international outlook and links with many other seafaring towns and cities. During the 20th century, Bilbao became a busy port, renowned for its shipbuilding and with a large industrial steel base closeby. Post Franco, the region had to deal with reinstated political autonomy, and the major economic crises of the 1970s and 1980s which engulfed most of Europe and the developed world. It also had to respond to the misfortune of a flood of Biblical proportions in 1983 which destroyed the city. Whilst balancing these multiple crises, the city was able to develop the political impetus for deep transformation in which the city shed its polluted past turning an ugly duckling into the beautiful and much wealthier swan. This was down to significant political leadership, an inclusive vision and the ability to turn a crisis into an advantage which provides an important template for other regional transitions.

Bilbao before and after



Grappling with multiple crises

The Basque regional government was formed in 1981 after post-Franco Spanish was reorganised. The regional government was able to maintain the *fuero* which gave it considerable authority to manage its city, raise taxes and ultimately be held accountable for all problems. The region had to deal with the aftermath of the oil crisis in 1973 and the need to restructure some of the vestiges of General Franco's industrial policy from the 1950-60s during which it had rapidly industrialised relying on heavy manufacturing.³⁸ The demand for labour was met by massive immigration from less developed Spanish regions, mainly from Andalusia. In 20 years, the population almost doubled from 216,000 in 1950 to 410,000 in 1970. During industrialisation,

the river became a sharp socio-economic boundary which still prevails. While Left Bank municipalities like Barakaldo and Sestao became associated with industrial uses and working-class housing, the Right Bank was developed at a slower pace, mostly for the middle-classes.³⁹

The first symptoms of an industrial, urban crisis were evident in the 1970s when the world economy went into recession after the oil-shock in 1973. Severe social problems, intense physical decay and a steep rise in unemployment between 1975 and 1985 were the most visible outcomes of urban decline. Since Bilbao's industrial structure was dominated by large manufacturing industries such as steel, shipbuilding and machine engineering, it was particularly hard hit by the crisis. Between 1975 and 1995, 60,000 manufacturing jobs – almost half of the existing industrial jobs – were lost in the metropolitan area. The proportion of manufacturing jobs dropped from 46% to 27%. Indicators such as the unemployment rate and demographic change suggest that problems reached their peak towards the mid-1980s.⁴⁰ Shipbuilding was another of the strongly affected sectors with a loss of 42.1% of jobs between 1982 and 1986. The closure of Euskalduna, one of the most emblematic shipyards in the region, was a deeply traumatic and symbolic process, with workers engaging in fierce battles with the local police in the autumn and winter of 1984. The conflict ended dramatically with the death of one worker and several injured in November 1984.⁴¹

The Spanish government agreed to pay the costs of relocating industry and paying for early retirement of workers over 50. The Basque government was given the mammoth task of rebuilding the city.

On top of the economic crisis, Bilbao had suffered from serious environmental degradation as a result of the industrial activities in the area. Air, water and soil were seriously polluted. Industrial waste and household sewage drained into the river without being treated until the late 1980s. The Nervión was therefore ecologically dead.⁴² Deindustrialisation also left a total of 340 hectares of obsolete industrial wastelands in metropolitan Bilbao. Many of the sites were covered with derelict industrial buildings and the soil was deeply contaminated by its former industrial uses. The environmental degradation of the area became striking in August 1983, when the city was hit by a severe flood of the Nervión river. The flood resulted in the death of thirty-seven people, with many of the medieval buildings of the Casco Viejo submerged by the water and the collapse of two of the city's bridges. The economic damage of the flood was estimated to be around €930 million (in 2005 prices).⁴³ The cleaning up after the flood revealed not only the physical decay of the historic neighborhoods but also the declining living conditions of the working-class population.⁴⁴

Every crisis is an opportunity

Local, regional and national leaders responded to the crisis with a programmatic strategy to address the fundamental economic and environmental problems of the area. Although the need for action became increasingly urgent, it took several years for a strategic approach to emerge in the late 1980s. The key catalyst for change was the 1983 flood. It helped to galvanise the political will for substantial change and a restoration of pride in the city as well as the Basque government.⁴⁵

The '*Strategic Plan for the Revitalisation of Metropolitan Bilbao*' was finally agreed in 1991 and it promoted an integrated approach to regeneration. A dedicated agency, 'Bilbao Metrópoli-30' was founded in 1991 to act as a facilitator for the regeneration process and to promote the objectives set by the strategic plan which included:

- Inner-city urban renewal; especially revitalisation of the Old Quarter
- Environmental intervention: river cleaning, industrial land recycling, implementation of Agenda 21
- Strengthening of cultural identity through culture-led regeneration
- Developing a knowledge-based high-tech sector

Another development agency – *Bilbao Ría 2000* – was created in 1992, with the aim of managing the large-scale revitalisation of abandoned land formerly occupied by the harbour quays and industries or by obsolete transport infrastructure.⁴⁶ Set up as a limited liability company and entirely publicly owned, Bilbao Ría 2000 was the frontpiece for the city's regeneration. To ensure accountability to Basque citizens, the Basque and

Spanish government were major shareholders alongside the railway and port authorities.⁴⁷ 80% of the finance came from Basque government's, 10% from EU funds and 10% from the sale of land. The company purchased land very cheaply from the port authority, railway company and industrial companies, invested in their clean-up and redevelopment for highly lucrative sale to commercial entities.⁴⁸ All profits from the sale of land had to be reinvested back into Bilbao 2000 for future projects ensuring that it is self-financing and acting in the public interest. Due to its responsibility in carrying out the main redevelopment schemes in Bilbao and the access to land, Bilbao Ría 2000 has in practice become the major planning and regeneration body in Bilbao.⁴⁹

The most emblematic and well-known redevelopment area is Abandoibarra, which is located in a prime location, along the river, in the centre of the city. The decision to regenerate the site was made in the mid-1980s. Since the 1990s, Bilbao Ría 2000 invested €184 million up to 2004.⁵⁰ The immediate objective was to reclaim the derelict site and turn it into a new functional centre capable of attracting local and international investment. Another purpose was to serve as a symbol for Bilbao's transformation from a declining, old industrial city into a revitalised, post-industrial metropolis fit for the 21st century. The most well-known development on the site is the landmark Guggenheim Museum designed by the architect Frank Gehry. Since its inauguration in 1997 the museum attracts an average of 800,000 non-Basque visitors a year (compared with less than 100,000 before the Guggenheim Museum Bilbao opened).⁵¹ Interestingly, over 90% of local inhabitants were against the project but it went ahead demonstrating the political vision and consensus within the various Mayors, across the political parties, various governments as well as the decision-making process of Bilbao Ría 2000. They saw this as being the key part of the transition process as it would give all the doubters, of which there were many, a real sense that the city can be successful in its transformation. Its inauguration was the moment all hearts and minds were won over to the transformation.⁵²

The project also tasked itself with renovating the local public transport such as the creation of an integrated and linked light-railway, bus and metro systems which connect many parts of the city and neighbouring towns.⁵³ It is estimated that over the last 20 years Bilbao Ría 2000 has been responsible for about 10% of all public investment in physical infrastructure in the metropolitan area.⁵⁴

The Guggenheim Museum and metro stations designed by Sir Norman Foster were vital to the success of the project and maintaining as well as building the strong sense of Basque pride. Each project is commissioned by a leading architect to ensure the city keeps its newly built vibrancy, dynamism, lifestyle and image. This has paid dividends for the city. While big landmark industries disappeared, a wealth of small and medium enterprises stayed, adapted and proliferated. Retraining, external marketing, new technology, links between sectors and financial support were offered as buttresses to vital parts of the economy.⁵⁵ Employment in hospitality and tourist-related services rose steeply, as the numbers of tourists arriving into Bilbao airport rose. Jobs in services grew from around 42% in 1975 to 65% in 1995. The unemployment rate fell steadily from the 1980s, from 25% to around 20% in 1997 and 11% by 2004. Population loss also slowed dramatically around the same time. Jobs were created in reclamation, construction, rebuilding and restoring, as well as in new high-tech sectors.⁵⁶

The new Zamudio technology park, supported by EU funding, gradually became more and more successful. Located close to the expanded airport, it built strong international connections, developed and housed over 300 businesses and employed 6000 people by 2006. Industrial jobs declined dramatically as a share of the total - from 48% in 1975, to 28% by 1996, and 22% by 2005.⁵⁷

The urban renewal process and the environmental intervention were effectively coupled with efforts in reshaping Bilbao's economy. European membership⁵⁸ catapulted the city into the knowledge and service sectors. Technology and innovation became the drivers of new enterprise. Overall, the number of jobs in the metropolitan area grew from 267,000 in 1995 to 380,000 in 2005.⁵⁹ The performance of Bilbao Ría 2000 has had relevant effects on economic activity in the Bilbao metropolitan area, in particular, on the generation of those sectors linked to the most modern processes of economic change and innovation, that is, the knowledge-intensive services.⁶⁰



Orgreave, South Yorkshire

The UK: A painful break with the past

The extreme brutality and politicisation of the battle with coal mining in the 1980s lingers at the back of both policy makers and workers when it comes to thinking about transition. Unlike Bilbao and North Rhine-Westphalia however, there was little planning made available to the former coal mining towns, villages and cities. This was partly because they covered so much of the country and also somewhat due to the prevailing ideology of the times. Yet, many of the regions clubbed together and took ownership for rebuilding many of the historic sites of the industrial revolution through experimentation, critical infrastructure investment, a mix of public-private partnership financing coupled with EU financing.

The long and tumultuous decline of the coal industry

Coal was the critical ingredient to the industrial revolution which powered the UK to global dominance. In its heyday in the 1920s, it employed over a million workers.⁶¹ Since that peak employment crashed in the 1930s and 1960s until its union, the National Union of Miners (NUM) came up against the Thatcher government in the 1980s. Government attempts to diversify the energy supply to nuclear and gas also played a role in the closure of coal mines and the loss of jobs. So too did the general perception that the UK had fallen behind the economic growth experienced by many of its competitors. High inflation, poor growth and abusive trade union power were blamed for the lack of innovation and declining prosperity. The annual wage rises, agreed through collective bargaining with the trade unions was seen as being the epicentre of the problem. The collapse of the Conservative government led by Ted Heath in February 1974 for the so called “who governs Britain” general election⁶² coupled with a desire to halt the notion of an eclipsed Britain ushered in the most violent break with the past engineered by the Thatcher government in the mid-1980s.⁶³

Margret Thatcher, Prime Minister at the time, believed in the introduction of market forces across the economy and breaking state run monopolies because according to her, the market was most effective at allocating resources and satisfying the needs of individuals. The tumultuous industrial relations of the 1970s were replaced by miner’s strikes. Thatcher’s response was hard and special police officers drafted in from London and the south of England, who had been trained in riot management and street battles. At one point it was even considered to send the army. Between 1980 and 1990 over 250,000 jobs went in the industry often leaving considerable social and economic devastation in towns and cities based solely on coal.⁶⁴

The conflict left bitter scars across the many towns embroiled all the way from the Midlands, across the north of England, and large parts of Scotland and Wales, many of which only came into existence because coal was found in their locality.⁶⁵ Coupled with economic decline, coalfield towns also suffered from

concentrated unemployment, poor infrastructure and severe health problems, according to the Coalfields Task Force.⁶⁶

Managing the aftermath

As the UK economy began to rebound and flourish through greater dominance of the services sector, attention shifted away from coal mining towns towards new economies. This spurred an innovative approach to taking ownership for regional regeneration based around the *Coalfield Communities Alliance* which recently became the *Industrial Communities Alliance* together with invaluable financial assistance from the EU. Collective pressure from former coalfield towns across Europe led to the establishment of the RECHAR Programme, an EU fund dedicated to regeneration of coalfield towns. The Programme ran from 1990-1993 and then 1994-1997 which provided over £250 million funding to UK coal mining towns.⁶⁷

In 1995 the government established three Special 'Enterprise Zones' in former coal mining regions in Yorkshire, Nottinghamshire and County Durham. The following year a major land reclamation programme was established - a partnership between the Coalfield Communities Alliance and English Partnerships, an agency responsible for land regeneration.⁶⁸ Similar to the Bilbao Ría 2000, this programme was responsible for regenerating specific towns and localities with new economic models. According to Professor Steve Fothergill, from Sheffield Hallam University and also the Director of the Coalfield Communities Alliance/Industrial Communities Alliance, there are some remarkable success stories in regeneration through this programme of which the Dearne Valley in South Yorkshire is the most notable.

The government invested £68 million into Manvers, a one time colliery, to transform it into a business park. The Manvers Business Park has attracted £425 million private sector investment and led to over 9,000 jobs in a variety of companies. Meanwhile, the largest (Hadfield) steel works in Sheffield, was turned into 1.5 million square foot Meadowhall Shopping Centre employing 7,000 people and generating about 756 million customer spending, whilst the property itself was worth £1.271 billion in 2009.⁶⁹ The region benefited from its location near the M1 motorway and the A1 roads which helped to link it to the wider regional economies. Glass Houghton in West Yorkshire is another example of successful regeneration. A former colliery and coke works, the land was contaminated and left derelict for over a decade until 1991 when the Wakefield Metropolitan District Council classified it as a 'Special Policy Area' and began a comprehensive redevelopment and reclamation scheme.⁷⁰ Plans to build 900 homes on the site were evaluated by Wakefield Council in 2015 to support a £1.6 million investment in a link road.⁷¹

This bottom-up regional push has led to one of the most innovative ways to address large clusters housing many individual polluters. Very few policy makers have attempted to find ways in which industrial emissions can be decarbonised. Much of the focus is on coal and transport. The Teeside CO₂ Collective, which houses 58% of the UK's chemical sector and contributes about £26 billion to national GDP, has started to explore engineering means to 'future proof' their polluting production to remain competitive in Paris Agreement world. Detailed engineering plans have been put forward to advance the innovative though costly CCS technology though they require finance from the EU and UK government to advance. If successful, this could trailblazer deeper decarbonisation across many other industrial regions across the EU by making them compatible with a below 1.5 degrees world.

Geography and access to transport links has an important role to play for in successful regeneration. The case of Ebbw Vale in the valleys of South Wales is a classic example of how more remote, less connected areas struggle more in regeneration. Although considerable strides have been taken to regenerate the area - more than £13 million was spent up to 2015 - it remains to be seen whether sufficient economic activity will be able to rejuvenate the area.

Key lessons from these case studies

Although each story has many unique geographical, historical and structural differences, together they tell a compelling and hopeful story.

1. **Political consensus:** For regional and local authorities, the commitment to transition was long-term, largely delivered through a consensus that sometimes crossed party politics. Local leaders were instrumental in identifying opportunities and ensuring that they came to fruition even though the specific project may have faced popular hostility as was the case with the building of the Guggenheim Bilbao Museum. The North Rhine-Westphalia Lande changed political parties on numerous occasions over its transition but the commitment to regenerate the region remained strong among the key personnel.
2. **Timing:** In most instances, once the change process started, the major transition took place within two decades. This was the time it took Bilbao to create its public-private partnership up to the moment where the physical nature of the city had completely changed. The same was true for many of the former coal mining regions in the UK which started to receive EU funding in the 1990s and had repositioned themselves within a decade.
3. **Ownership:** The visionary leaders owned the desire to transition because they were locally accountable. They were able to weave a course between the needs of the old industries and the desire to reposition business models across their regions. This accountability is a great success story for EU regeneration policy and needs to be emulated in EU climate policy.
4. **Division of responsibilities:** The regions focused on transformation whilst the national governments and the EU focused on sectoral support measures for the coal and manufacturing industries. This should be replicated across the EU in regions where major transition is required.
5. **Break with the past:** In many instances, it was impossible to maintain the status quo. Bilbao had to be rebuilt as did the coal mining towns and cities. Germany witnessed a delay in the hard coal exit as trade unions sought more time. In the end the German government could afford to pay for this. It is questionable if other governments will be able to do so given the far more substantial costs associated with climate change.



Part III

The way forward

Policy architecture for the new social contract

To enable local, national and regional governments manage the transition to clean, secure and sustainable economic models, a new approach to EU policy making is required. Consequently, priority action is required in regions and cities where the economy is based on a single or multitude of polluting industrial activity.

Policy needs to enable effective investment in clean infrastructure and a managed, fair and just transition away from climate polluting means of production and consumption. Both aspects have to go in tandem to ensure a modern, efficient and clean Europe is built and importantly, no one is left behind in this transition. This is the new social contract which should drive the purpose of the EU to 2050.

The main elements of this new social contract are ownership, finance, management and delivery. If we look at these four elements in the context of policy recommendations we propose the following:

1. Ownership

To enable ownership of the challenges to be taken, the first steps are:

- a. All regions based on a single or cluster of climate polluting production capacity must be identified as **Just Transition Regions** at a European level. This is the role of the European Commission because it will aid targeted investment through European funds. By doing so the relevant Member States, local and regional authorities, workforces, communities and stakeholders will be able to participate in a constructive and strategic discussion.
- b. It would be useful if the Commission could provide **sectoral overviews of key polluting activities** such as coal mining and utilisation, petroleum refineries, blast furnace steel, etc, because solutions to these sectors can only be addressed at an EU and Member State level, as witnessed in the three case studies. These should include the number of high-carbon employees per Member State, age; relevant State Aid approvals; the cost and number of direct and indirect subsidies for climate polluting activities at national and EU level; opportunities for technical abatement, and where there is a cluster of large polluters, an insight into the constitution of this cluster. This would help identify key areas and address and manage the Transition better.
- c. Within each Just Transition Region, a requirement for financial assistance (EU funding, special State Aid requirements) should be dependent on the establishment of a **Sustainable Energy & Climate Action Plan (SECAP)** or an equivalent local investment plan which details the *100% reliance on zero-carbon energy and transport by 2050* because they will outline a the region's commitment to transition away from polluting capacity. If appropriate, an entity responsible for the delivery of clean investments outlined in SECAPs or their equivalent, can be established similar to Bilbao Ría 2000 and the Coalfields Communities Alliance-English Partnerships approaches.

2. Financing

Adequate, timely and accessible sources of finance are pivotal to successful transition. Therefore a dedicated financial stream, in the form of a **Just Transition Fund** is required. This could easily be set up within the framework of the EU Emissions Trading System (EU ETS) because the perception is that this instrument is responsible for the loss of jobs and investment. It is an essential part of the new social contract that those who are to be most impacted upon by the change will have a dedicated financial stream. It's objective should be to aid the closure of a climate polluting plant by covering the costs of associated environmental redress, retraining of workers and where appropriate, their early departure. This would build confidence in the transition as well as the effectiveness of the climate policy. EU ETS will not be able to finance this alone so support from dedicated funds within the Multiannual Financial Framework (MFF) and, if appropriate, private

finance will be required.

The MFFs of the past had dedicated sectoral funds to aid specific sectoral transitions such as the RECHAR programme (regenerating former coalfields with a budget of ECU 700 million);⁷² the RESIDER programme (regenerating steel-making areas with a budget of ECU 800 million);⁷³ and the RENAVAL programme (regenerating shipbuilding areas) with a budget of ECU 200 million.⁷⁴ We would welcome such funds to be reintroduced and streamlined to allow better access to timely and effective finance, which can also be used to attract private finance.

3. Management, delivery and reporting

The skillsets of leadership differ with respect to successful implementation. Visionary leaders, the iconic men and women who develop and lead a vision of a better future are vital in capturing the hearts and minds of everyone going through the process of change. Equally important, is the management skillset focused on project management and delivery of outputs. Both are critical to successful regional transformation.

To aid this, local governments and regional authorities should be required to report on the progress of implementing their SECAP or alternative investment plan through the **Energy Governance guidelines**. Streamlined indicators should be used which focus on system change across key sectors. For example, in the transport sector - the total number of public buses in a location measured against the total number shifted to non-climate polluting fuel such as electricity. Some investments, such as the establishment of educational facilities, require a critical infrastructure or social value indicator to be adequately reflected in reporting requirements.

4. Effective policy design to ensure timely closure or abatement of large climate polluting plants

The solutions above are proverbial carrots to hasten a transition process. However, without a sufficient stick to drive the change process, these proposals will have limited impact. Incentives for change come either by a profound shock such as the flood in Bilbao, the collapse of the post war economy after the 1973 oil crisis or through policy. Effective policy that stimulates a break with the past will be, by its very nature, confrontational to incumbents. It has to be to in order to engineer a point of no return which spurs transition. Without this, incumbent polluters will not seek to change their activities let alone enter into negotiations for plant closure. This is the case for a new social contract. It would be most effective if it is carried out in the name of all society. It means the right to a dignified, fair and just transition away from climate pollution within an optimal timeframe set by science whilst ensuring no one is left behind through the transition.

The European Commission could be empowered to propose this on the basis that it is acting in light of the scientific, economic, moral and political need to maintain prosperity and peace in the interest of all Europeans. Although it would likely encounter a multitude of hostility from incumbent industry as well as Member States captured by these vested interests, no other institution is able to start this process and overcome the many obstacles that challenge its success. The institutional framework outlined as well as a long-term commitment to see the transition to its completion is key to winning over the majority of parties. Hardwiring this social contract into regulations and institutions coupled with a coordinated approach to decision-making has to be key to policy.

The best means to achieve this is to set robust limits and end points for the production and use of fossil fuels in Europe, particularly in areas where a multitude of clean technology options exist already which allows polluting technology to be increasingly displaced by clean technology. This is the case for electricity generation and surface mobility, the biggest culprits for climate change pollution, responsible for 55% and 23% of EU greenhouse gas emissions in 2014 according to Eurostat, the statistical office of the EU.⁷⁵ This means: a) the *phase out of coal production and unabated utilisation*, and b) the *phase out of production capacity and utilisation of fossil fuels in surface*

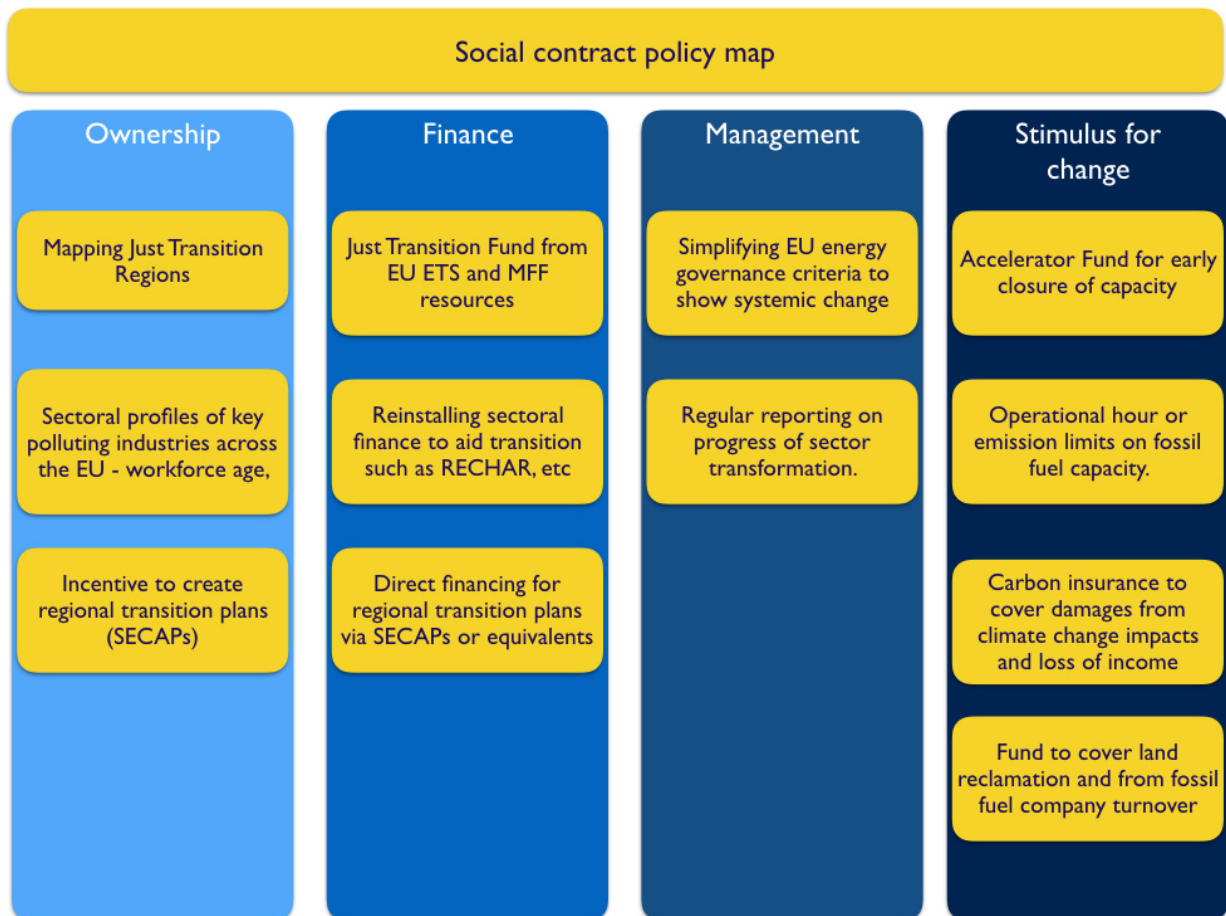
transport.

Workers over a certain age could be supported through early retirement programmes similar to those in each of the case histories. Production capacity such as coal-fired plants and petroleum refineries would have dates for closure. An **accelerator fund**, from the MFF or Just Transition Fund, could be used to compensate 100% the first ten installations which apply for closure. The next ten receive 80% compensation whilst the last remaining installations would not receive any compensation.

To ensure pressure for investment in abatement is maintained, all plants which do not qualify for the Accelerator Fund would have an **emission and time limits** placed for their lifetimes increasing the economic inefficiency of not managing their climate pollution. To avoid energy insecurity or economic disruption, compensation from the Accelerator Fund should come in the shape of clean technology assets deployed which displace the climate polluting capacity.

Finally, additional measures are required to bring these polluting industries to the negotiation table. Current policy is ineffective in doing so. The optimal solution is to avoid socialising the cost of climate change impacts by asking these companies to take out **carbon insurance** to cover the cost of future damages as well as supporting their workforces with adequate retraining. To reduce the burden on local and national governments with respect to land reclamation, each polluting company should be required to contribute a percentage of their turnover towards a single body responsible for **financing land reclamation and cleaning**. The Single Resolution Board provides a similar service to the EU banking sector to avoid taxpayers having to foot the bill for their failure.

Figure 3: Social contract policy map



Conclusion

The ratification of the Paris Agreement is a game-changer in terms of the political commitment to avoid dangerous climate change by staying below 1.5 degrees. It is impossible to build walls high or robust enough to keep the systemic threats posed by a 1.5 degrees world. Simultaneously, the old fossil fuel world faces new and at times profound competition from increasing numbers of new entrants across clean technology sectors. Together, they form formidable drivers for change. Europe's political economy question changes with them. Once it centered on getting the world to support action on climate change. Now it must focus on how to decarbonise within the timescale set by science whilst minimising social unrest, inequality and disenfranchisement.

Change will be hardest felt in heavy industrial regions whose business models are based on carbon-intensive activity. Our investigations into Bilbao, North Rhine-Westphalia and former UK coalfield towns show that once local governments take ownership of the need to transition, they have been able to dramatically redesign local socio-economic models in a timespan of about 20 years. This is the kind of timescale needed to stay below 1.5 degrees. Getting adequate public and private finance to local authorities is one of the keys to success. The other is the need for effective policy that delivers decarbonisation. Current EU climate policy is a long way from being effective. New measures are needed and needed now.

We propose shifting the current climate policy conversation, which is captured by slow moving and at times ineffective measures, with a **new social contract** in which adequate policy systemically drives our high carbon whilst supporting regions and workers in need. As the playwright, George Bernard Shaw said, *"Progress is impossible without change, and those who cannot change their minds cannot change anything"*. This is why a new approach to decarbonisation policy and its management is required. Our report has shown that where there is a political will, often at a local level, there is a way to initiate deep transition across the EU. Now we have to turn these lessons into the blueprint for EU legislation.

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⁷³ Community programme (EEC) to assist the conversion of steel areas, 1988-1991 http://cordis.europa.eu/programme/rcn/132_en.html and 1994-1997 http://cordis.europa.eu/programme/rcn/486_en.html accessed on 26 September 2016.

⁷⁴ Community programme (EEC) to assist the conversion of shipbuilding areas (RENAVAL), 1988-1991 http://cordis.europa.eu/programme/rcn/68_en.html accessed on 26 September 2016.

⁷⁵ Eurostat website retrieved on 6 September, 2016. See [http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Greenhouse_gas_emissions_analysis_by_source_sector_EU-28_1990_and_2014_\(percentage_of_total\)_new.png](http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Greenhouse_gas_emissions_analysis_by_source_sector_EU-28_1990_and_2014_(percentage_of_total)_new.png)

Contributors



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Sanjeev founded **Change Partnership** to solve the politics of climate change. He has been engaged in climate change, energy, transport and politics for over 20 years. Previously, he worked **WWF**, a conservation organisation; **E3G**, a think-tank; the **Energy Institute** which is responsible for professional standards in the industry; and the **Crown Estate**, which is responsible for land owned by Her Majesty the Queen. He read History at **Queen Mary University** and Energy, Technology and Economics at **City University** both in London.



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Dedicated to Vinod Kumari (1946-2016) who showed that anything is possible when we put our minds to it.

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Change Partnership is a not-for-profit thought-leadership and activist organisation focused on solving the politics of climate change. Further information can be found at www.changepartnership.org



This book explores the socio-economic dimensions of climate change. It argues that climate change is not just an environmental issue but about a fundamental change to the business upon which the wealth and prosperity of many nations and regions is built. Policy is required to deconstruct fossil fuels whilst ensuring that clean technology solutions are introduced and the socio-economic fabric of the regions that have to transition the most is maintained. The ultimate policy choice is between a managed transition or a chaotic and potentially violent break with the past. Hence the case for a new social contract based on delivery of a clean and safe future in which none is left behind through the transition.

Europe actually has experience of managing the required transition. Its response to the economic crisis of the 1970s and 1980s demonstrated its ability to organise financial support for workers whose industries have disappeared as well as targeted support for regional rejuvenation through coercion and structural funds. To solve climate change, these tools need to be revised, streamlined and reintroduced.

Particular emphasis needs to be placed on regional regeneration as this is where the hearts and minds of the climate change transition will be won or lost. We explore three localities that underwent radical and deep transformation - North Rhine-Westphalia in Germany, Bilbao in Spain and the coalfields of across the UK. In each instance, local governments took ownership of the need for transformation and went about building new infrastructure and sometimes experimental business models. EU financing needs to be directed to empower local authorities and regional governments maximise this opportunity. This is the basis of the Just Transition.

However, all of these transitions were in essence, attempts to manage the aftermath of a major shock. Climate policy is a long way to having this kind of impact yet this is what is required. EU policy has to be drastically improved to ensure that polluters have transparent time limits on their damaging activities whilst also covering the total of these activities which gives impetus for them to enter negotiations about managing their transition.

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