Climate & Development Knowledge Network

POLICY BRIEF

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Key messages

- In December 2015, governments are expected to agree an international climate deal in Paris, France. A high-ambition climate agreement – defined as an agreement that limits global warming to 2°C by 2100 – will be essential to achieving the SDGs.
- New research commissioned by CDKN shows that efforts to eradicate extreme poverty, equalise gender relations and provide access to energy and water during the next 15 years will be undermined by a low-ambition climate agreement. The CDKN research demonstrates these links with a global analysis and detailed studies of the poverty–climate connection in Dominica, Jamaica, Pakistan and Uganda.
- The research showed that by 2030 a low-ambition agreement is likely to result in 80–140% higher poverty levels for Asia and sub-Saharan Africa, and 25% higher poverty levels for Latin America and the Caribbean, than a high-ambition agreement.

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How a high-ambition global climate deal will help achieve the Sustainable Development Goals

Introduction

This year, governments will agree Sustainable Development Goals (SDGs) for the period to 2030, and a new global climate agreement, to take effect from 2020. Together, these could set the course for environmental sustainability and human well-being this century. The agreements together offer a once-in-a generation opportunity to end extreme poverty, create climate resilience and avoid dangerous levels of climate change by committing to zero net carbon emissions.

This policy brief explores the relationship between the level of ambition in the global climate agreement and countries' subsequent ability to achieve the SDGs, globally and in selected case study countries. It aims to provide decision-makers and negotiators at the 21st Conference of the Parties of the United Nations Framework Convention (UNFCCC COP21) with a better understanding, and quantitative evidence where possible, of the implications of the climate agreement for the SDGs.

This brief is based on a research study, presented in a longer technical report commissioned by CDKN from HR Wallingford and Metroeconomica and published on www.cdkn.org

What is an ambitious climate agreement?

The CDKN research set out to explore how a high- or low-ambition climate agreement would affect national, social, economic and policy responses – and so affect poverty and other aspects of human development. The research team contrasted two alternative futures: by pairing two greenhouse gas emissions scenarios with two socioeconomic development scenarios.

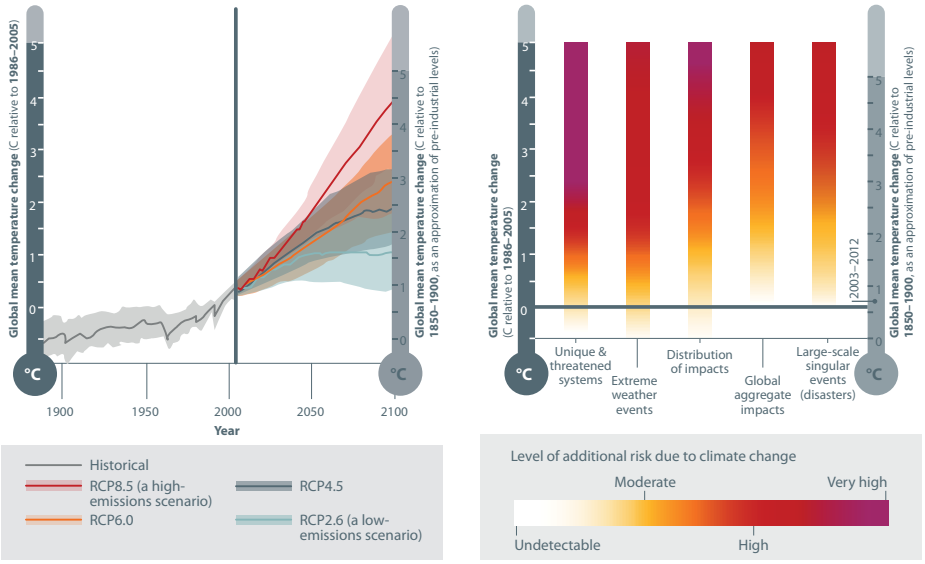
The scenarios of future concentrations of greenhouse gases are referred to as Representative Concentration Pathways (RCPs)[1] and future developments in economic growth and development are referred to as Shared Socioeconomic Pathways (SSPs) – see Box 1, page 2.[2] These SSPs were considered by the Intergovernmental Panel on Climate Change (IPCC) as part of its *Fifth Assessment Report*.[3] Rather than starting with socioeconomic scenarios that lead to different greenhouse gas emissions scenarios, the new pathways take

alternative, future greenhouse gas and aerosol concentrations as their starting point.

The study considers two scenarios:

High-ambition climate agreement scenario: A high-ambition climate agreement will be one that aims to send the world on a trajectory of declining greenhouse gas emissions over the century ultimately achieving zero net carbon emissions, and which limits global warming to 2°C by 2100 compared to present-day levels.[4] This is 'RCP4.5'. (Although lives and livelihoods are already at risk from climate change today, scientific analysis shows that warming of greater than 2°C would have even more widespread and dangerous consequences, see Figure 1). To describe the high-ambition scenario, the study pairs this lower emissions pathway together with a socioeconomic

Figure 1. Greenhouse gas concentration pathways and impacts of global warming



Source: IPCC (2013, 2014); Knutti, R. and Sedláček, J. (2013).[5]

The graphs above map Representative Concentration Pathways or RCPs of greenhouse gases in the atmosphere against projected global temperature change (left) and demonstrate how these average temperature changes would affect key earth systems (right).

Box 1. Shared Socioeconomic Pathways

Over the past 2–3 years, scientists have produced 'Shared Socioeconomic Pathways' (SSPs) in response to the need to map out possible socioeconomic and environmental futures. These can be used alongside the different emissions pathways and correlated climate change scenarios.

The SSPs outline the potential state of human societies and ecological systems at a macro scale and have two elements: a narrative storyline and a set of quantified measures, which will be used to measure societal variables as they evolve over the 21st century. The SSPs incorporate existing climate policies but assume no new (future) climate policies. They were created under the assumption of no significant climate feedback on development pathways.

Each combination of an SSP and a climate change trajectory (see Figure 1) creates a family of macro-scale scenarios. These can help answer questions about the possible magnitude of the impacts of climate change, the extent to which adaptation and mitigation policies can reduce those risks, the human and financial resources required to implement climate and sustainable development policies, and the range of uncertainty in all these estimates.*

The SSPs help to highlight the importance – to impact, adaptation and vulnerability researchers and policy-makers – of considering the many socioeconomic dimensions that will influence the magnitude and extent of future climate change. For example, the climate is one of many factors influencing the geographic range and incidence of malaria in Africa. Projections of demographic change and economic growth are, on their own, not enough to understand how development pathways could modify the projected impacts of climate change on malaria. With the wider range of quantitative and qualitative information available in the SSPs, researchers can address more thoroughly how different development pathways could modify the future burden of malaria within one RCP. This can give policy- and decision-makers a better sense of how much different adaptation initiatives could accomplish, and what the residual impacts might be.**

Source: * The above text is adapted from: Ebi, K. et al. (2014).[6]
** Willbanks, T. and Ebi, K. (2014).[7]

development pathway where policies are in place for relatively rapid income growth and *substantially reduced* reliance on natural resources.[8]

Low-ambition climate agreement scenario: A low-ambition climate agreement would be one with weak government commitments to cut greenhouse gases, which could result in a scenario of 3–5°C average temperature rise by 2100 compared to present-day levels.[9] This is 'RCP8.5' (see Figure 1). To describe the low-ambition scenario, the study pairs this higher emissions pathway together with a socioeconomic development pathway where economic growth is slower due to lack of international cooperation, slow technological progress and low education levels.[10]

For both high- and low-ambition climate agreements, there is a continuum of possible regional and national responses and resulting social, economic and climate policies.[11] The study team cannot be altogether certain that the emissions and socioeconomic scenarios it has paired together will be realised. However, current research illustrates that a high-ambition scenario combined with the right policies to achieve low-carbon growth is indeed likely to result in the 2°C future and stable socioeconomic outcomes as described above. A recent report by the Global Commission on the Economy and Climate[12] shows that a package of measures – including reduced fossil fuel subsidies, the pricing of carbon throughout the economy, innovative finance for low-carbon investments, increased subsidies for research and development in low-carbon energy and policies to ensure compact city development – will result in sustained green growth of the kind that is characterised by the first socioeconomic scenario.[13] The Commission's report argues (as have a number of others) that the high emissions/low-ambition climate scenario will result in lower growth and greater inequality in the medium to long term.

The conclusions of the analysis are presented in the following sections.

A high-ambition climate agreement in 2015 is key to achieving the SDGs by 2030

The decisions that were taken at UNFCCC COP20 in Lima and those that will be taken at COP21 in Paris will have a significant impact on global development over the lifetime of the SDGs (2015–2030). The draft SDGs (as of early 2015) are listed in Boxes 2 and 3.

The relationship between human society's greenhouse gas emissions and the changing climate is a complex one because a steep spike or dip in emissions does not immediately speed up or slow down climate change. The consensus of world climate scientists under the IPCC say it is 'extremely likely' that human activities are contributing to climate change but they find that the earth's physical systems respond only after a period of decades to changes in greenhouse gas concentrations.[14] Thus, even if society stopped emitting greenhouse gases today, the earth would face climate change – in the form of rising temperatures and changing rainfall patterns – until the middle of this century.

However, global society's ambition in curbing greenhouse gas emissions between now and 2030 will have a fundamental effect on the amount of global warming and the frequency and severity of weather-related disasters after 2030.

A high-ambition climate agreement is essential to creating the best chance of achieving the SDGs by 2030 because:

- It can provide a clear policy framework and the legal basis for action on climate change.
- It can incentivise international cooperation on climate change.
- It can mobilise additional finance and resources for mitigation and adaptation activities that support climate compatible development.

A high-ambition climate agreement can potentially have a significant impact on the state of the economy and social well-being in the poorest and most climate vulnerable countries before 2030, improving the likelihood that they will achieve the SDGs. Likewise a low-ambition agreement puts their chances of sustainable development at risk.

In particular, the poverty- and energy-related SDGs depend on a global climate agreement that is strong on climate mitigation, adaptation and financing.

CDKN-commissioned research shows that – globally and in the case study countries – a low-ambition climate agreement will undermine the achievement of the SDGs

The CDKN research considers impacts on development in the next 15 years, including economic impacts, under two scenarios for the 2015 climate change agreement: a high-ambition agreement and a low-ambition agreement (as defined above), with associated policies and levels of investment in mitigation and adaptation.

At the global and regional levels, this research suggests that a high-ambition climate agreement is most

Box 2. Draft Sustainable Development Goals (April 2015)

Goal 1. End poverty in all its forms everywhere

Goal 2. End hunger, achieve food security and improved nutrition, and promote sustainable agriculture

Goal 3. Ensure healthy lives and promote wellbeing for all at all ages

Goal 4. Ensure inclusive and equitable quality education and promote life-long learning opportunities for all

Goal 5. Achieve gender equality and empower all women and girls

Goal 6. Ensure availability and sustainable management of water and sanitation for all

Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all

Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation

Goal 10. Reduce inequality within and among countries

Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

Goal 12. Ensure sustainable consumption and production patterns

Goal 13. Take urgent action to combat climate change and its impacts

Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combatdesertification, halt and reverse land degradation and halt biodiversity loss

Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Goal 17. Strengthen the means of implementation and revitalise the global partnership for sustainable development

Source: https://sustainabledevelopment.un.org/focusdgs.html

Box 3. Sustainable Development Goals – Draft targets for SDG 13, climate change (April 2015)

The draft targets for SDG 13 on climate change are presented for illustrative purposes; the full list of draft targets is available online.

Goal 13 Take urgent action to combat climate change and its impacts*

13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries

13.2 Integrate climate change measures into national policies, strategies and planning

13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning

13.a Implement the commitment undertaken by developed country Parties to the UNFCCC to a goal of mobilising jointly US$100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation, and fully operationalise the Green Climate Fund through its capitalisation as soon as possible

13.b Promote mechanisms for raising capacities for effective climate change-related planning and management, in LDCs, including focusing on women, youth, local and marginalised communities

* Acknowledging that the UNFCCC is the primary international, inter-governmental forum for negotiating the global response to climate change.

Source: https://sustainabledevelopment.un.org/sdgsproposal

crucial to achieving the proposed SDGs relating to poverty (SDG 1), inequality (SDG 10), climate change (SDG 13) and global partnerships for sustainable development (SDG 17). For example, under the low-ambition agreement, poverty levels in 2030 are projected to be 80–140% higher for Asia and sub-Saharan Africa and 25% higher for Latin America and the Caribbean compared to the high-ambition scenario.

Selected country case studies show that at the national level, the nature of the links between the climate agreement and the achievement of SDGs varies from country to country. In the Caribbean states of Dominica and Jamaica, the SDG relating to poverty (SDG 1) is the most sensitive to the differences in the climate ambition, while in Pakistan and Uganda the SDGs relating to poverty and energy (SDGs 1 and 7, respectively) are the most sensitive to the level of climate ambition.

Table 1 contrasts the likely influence of a high-ambition climate change agreement versus a low-ambition climate change agreement on achievement of selected SDGs in Dominica, Jamaica, Pakistan and Uganda. Box 4 provides illustrative examples from the country case studies (for a fuller explanation, please see the full technical paper on www.cdkn.org).

The table gives the level of confidence in the estimate of the magnitude of risk. At the country level, the high-ambition agreement is estimated to have the greatest impact in changing the outcome for the achievement of the SDG on poverty, when compared to the outcome for the low-ambition agreement, for Dominica and Pakistan. For all four of the case study countries, the level of ambition in the climate agreement will influence the achievement of the SDGs considered in the study.

Box 4. Projections of poverty under high- and low-ambition climate agreements: insights from the case studies

For all four of the case study countries, we see a strong link between the level of ambition in the climate change agreement and the achievement by 2030 of the SDGs considered in the study. A review of the poverty projections gives an insight into what could be at stake.

For Jamaica, under a high-ambition agreement, the poverty head count is projected to decline from 490,000 (2015) to 180,000 (2030). Under a low-ambition agreement, poverty is only projected to decline to 400,000 (2030). Similarly for Dominica, a high-ambition agreement is projected to lead to a poverty head count decline from 20,700 (2015) to 10,200 (2030), whilst under a low-ambition agreement poverty is projected to decline to 16,600 (2030). In Pakistan, poverty is projected to decline from 25 million people (2015) to zero (2030) under a high-ambition agreement and to 8.6 million (2030) under a low-ambition agreement (the steep decline is according to the SSP analysis in this study and is partly based on the Government of Pakistan's own strong poverty reduction projections). Finally, in Uganda, poverty is projected to decline from 15 million (2015) to 12 million (2030) under a high-ambition agreement, whereas interestingly under a low-ambition agreement it is projected to increase to 19 million (2030).

For further analysis

This research provides new insights on the links between the policy implications of the 2015 climate agreement and SDGs. This is an area that has not been well researched so far. Areas that are recommended for further research include:

- enhancing understanding of development pathways that are possible under different global warming scenarios and associated scenarios for cutting greenhouse gas emissions
- exploring the links between extreme events and poverty and how climate agreements can influence those;
- exploring the many co-benefits of a low-carbon energy development programme and how these relate
- to the SDGs
- deepening the analysis of implications of the climate agreement for SDGs at the global and regional level
- improving measurement of how women are affected by climate change and the SDGs, and can play a role in sustainable development scenarios.

Enhancing information in these and other areas will help to advance understanding, fill knowledge gaps, foster political will and support strong – even transformational – climate compatible development policies to meet the challenges of our century.

Table 1. Risk of failure to achieve the SDGs by 2030

		Sustainable Development Goals		Risk		Confidence
				High-ambition	Low-ambition	
Global level		SDG 1	Poverty			
		SDG 5	Gender equality			
		SDG 6	Water and sanitation			
		SDG 7	Energy			
Country level	Dominica	SDG 1	Poverty			
		SDG 5	Gender equality			
		SDG 6	Water and sanitation			
		SDG 7	Energy			
	Jamaica	SDG 1	Poverty			
		SDG 5	Gender equality			
		SDG 6	Water and sanitation			
		SDG 7	Energy			
	Pakistan	SDG 1	Poverty			
		SDG 5	Gender equality			
		SDG 6	Water and sanitation			
		SDG 7	Energy			
	Uganda	SDG 1	Poverty			
		SDG 5	Gender equality			
		SDG 6	Water and sanitation			
		SDG 7	Energy			

'Risk of failure to achieve a SDG' combines the likelihood of failing to achieve a SDG with the magnitude of departure from the SDG for a given climate agreement scenario.

Very high risk of failure to achieve the SDG – Very likely that the SDG will not be achieved and potential for substantial departure from the SDG. Very unlikely to achieve the SDG.

High risk of failure to achieve the SDG – Likely that the SDG will not be achieved and potential for moderate to substantial departure from the SDG. Unlikely to achieve the SDG.

Medium risk of failure to achieve the SDG – About as likely as not that the SDG will not be achieved and potential for moderate departure from the SDG. About as likely as not to achieve the SDG.

Low risk of failure to achieve the SDG – Unlikely that the SDG will not be achieved and potential for small departure from the SDG. Likely to achieve the SDG.

Very low risk of failure to achieve the SDG – Very unlikely that the SDG will not be achieved and potential for negligible departure from the SDG. Very likely to achieve the SDG.

'Confidence' is the degree to which the findings of the assessment are considered valid, based on the type, amount, quality and consistency of evidence, as well as the degree of agreement on the evidence.

High confidence – Reliable analysis and methods, with a strong theoretical basis. This includes modelling or analytical methods that have made use of climate or SSP projections.

Medium confidence – Estimation of potential implications for SDGs based on reliable information, e.g. evidence of causal links or analytical estimation methods based on historical information and projected data.

Low confidence – Expert view of potential implications for SDGs based on limited information, e.g. anecdotal evidence, or very simplistic estimation methods based on historical information.

Table 1 (continued)**. Risk of failure to achieve the SDGs by 2030**

SDG	Method for assessing risk of failure to achieve the SDG
SDG 1 Poverty	An integrated assessment model was used to estimate changes in the number of people below the poverty line under the two climate agreement scenarios.
SDG 5 Gender equality	Estimated based on recent observed trends available in the literature, progress towards achieving the Millennium Development Goals (MDGs), and the authors' understanding of how a potential climate agreement might influence gender equality.
SDG 6 Water and sanitation	Estimated based on recent observed trends available in the literature, progress towards achieving the MDGs, and the authors' understanding of how a potential climate agreement might influence access to safe drinking water and improved sanitation facilities.
SDG 7 Energy	An integrated assessment model is used to estimate changes in the non-fossil energy shares under the two climate agreement scenarios.

Endnotes

1 The Integrated Assessment Modelling Consortium (IAMC), a scientific organisation, coordinated the review and release of the RCPs.

2 Researchers from the Integrated Assessment Modelling (IAM) and Impacts, Adaptation and Vulnerability (IAV) communities developed the SSP storylines/narratives. O'Neill, B.C., Carter, T.R., Ebi, K.L., Edmonds, J., Hallegatte, S., Kemp-Benedict, E., Kriegler, E., Mearns, L., Moss, R., Riahi, K., van Ruijven, B. and van Vuuren, D. (2012) *Workshop on the nature and use of new socioeconomic pathways for climate change Research, Boulder, CO, November 2-4, 2011. Meeting Report Final Version, March 12, 2012.* (http://www.isp.ucar.edu/socio-economic-pathways).

3 See http://sedac.ipcc-data.org/ddc/ar5_scenario_process/

4 RCP4.5 (see Figure 1). This is derived from: IPCC (2013). *Climate change 2013: The physical science basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., Qin, D., Plattner, G.-K., Tignor, M., Allen, S.K., Boschung, J., Nauels, A., Xia, Y., Bex, V. and Midgley, P.M. (eds.)]. Cambridge, UK, and New York, USA: Cambridge University Press.

5 IPCC (2013). *Climate Change 2013: The Physical Science Basis*. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., Qin, D., Plattner, G.-K., Tignor, M., Allen, S.K., Boschung, J., Nauels, A., Xia, Y., Bex, V. and Midgley, P.M. (eds.)]. Cambridge, UK and New York, NY: Cambridge University Press, Cambridge. Technical Summary. Figure TS-15; Knutti, R. and Sedláček, J. (2013) 'Robustness and uncertainties in the new CIMP5 climate model projections'. *Nature Climate Change* 3: 369–373. doi:10.1038/nclimate1716; IPPC (2014). *Climate Change 2014: Impacts, Adaptation, and Vulnerability*. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., Barros, V.R., Dokken, D.J., Mach, K.J., Mastrandrea, M.D., Bilir, T.E., Chatterjee, M., Ebi, K.L., Estrada, Y.O., Genova, R.C., Girma, B., Kissel, E.S., Levy, A.N., MacCracken, S., Mastrandrea, P.R. and White, L.L. (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Summary for Policy Makers (Assessment Box SPM.1 Figure 1, p39). Graphic artwork in Figure 1 by Soapbox (www.soapbox.co.uk) for CDKN based on the references above.

6 Ebi, K., Hallegatte, S., Kram, T., Arnell, N.W., Carter, T.R., Edmonds, J., Kriegler, E., Mathur, R., O'Neill, B.C., Riahi, K., Winkler, H., Van Vuuren, D.P. and Zwickel, T. (2014) 'A new scenario framework for climate change research: background, process, and future directions', *Climatic Change* 122: 363–372.

7 Willbanks, T. and Ebi, K. (2014) 'SSPs from an impact and adaptation perspective', *Climatic Change* 122: 473–479.

8 This is known as SSP1.

9 RCP8.5 (see Endnote 4 references).

10 This is known as SSP3.

11 In principle the SSPs can be combined with any of the RCPs, although the IPCC research community recognised that some of the combinations maybe inconsistent (e.g. a high level of radiative forcing with a rapid shift to renewables).

12 NCE (2014) *Better growth, better climate. The new climate economy report*. Washington, DC: The New Climate Economy, The Global Commission on the Economy and Climate.

13 SSP1.

14 IPCC (2013). Op. cit.

About CDKN

The Climate and Development Knowledge Network (CDKN) aims to help decision-makers in developing countries design and deliver climate compatible development. We do this by providing demand-led research and technical assistance, and channeling the best available knowledge on climate change and development to support policy processes at the country level.

About HR Wallingford

HR Wallingford is an independent, non-profit distributing organisation with a 60-year track record of applied research and specialist consultancy. It has a unique mix of know-how, facilities and expert staff with world-renowned skills and experience in water security and climate resilient development. HR Wallingford has a long record of working on international water and development issues specialising in the provision of expert climate change impacts and adaptation, development of frameworks and decision support tools. An extensive programme of ongoing strategic research underpins the company's technology base and ensures its staff remain at the forefront of knowledge and have access to innovative techniques that are generally not yet used by others in the industry.

About Metroeconomica

Metroeconomica is an independent consultancy group specialising in economic and policy analysis of environmental, resource use and sustainable development issues. It offers expert services to a wide range of clients from national, regional and local governments and international donor organisations, to private sector companies and non-governmental organisations. Metroeconomica's participation in major international projects in many countries worldwide is based on its reputation as one of Europe's leading institutions in the economic and policy assessment of key local, regional and global environmental issues. Metroeconomica worked on the SDGs for the Commonwealth Secretariat and for the UNDP World We Want 2015 programme, moderating the discussion on growth and sustainability.

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