



## Economic and Social Council

Distr.: General  
5 April 2011

English only

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### Economic Commission for Europe

#### Conference of European Statisticians

Fifty-ninth plenary session

Geneva, 14-16 June 2011

Item 6c of the provisional agenda

**Manuals, guidelines, recommendations, frameworks, etc. prepared under the auspices of the Conference**

### **Proposed indicators that could be used to measure sustainable development**

**Note by the joint United Nations Economic Commission for Europe/Eurostat/Organisation for Economic Co-operation and Development Task Force on Measuring Sustainable Development**

#### *Summary*

The present note constitutes an addendum to the document ECE/CES/2011/4 “Summary of the report on measuring sustainable development”. It presents the themes and possible indicators that could be used for measuring sustainable development. It also includes an overview of data availability of selected indicators. At the end is presented the table of contents of the full report of the Task Force on Measuring Sustainable Development.

## Introduction

(The list of themes and indicators below was discussed by the Task Force in November 2010. There is a large amount of agreement on this approach, but this list can by no means be seen as the definite outcome of the Task Force!)

1. This Addendum discusses indicators that might be adopted for sustainable development. The indicators are discussed according to the themes that have been identified in the summary. Note that the themes are structured according to the policy categorization (see table 2). Distinctions are made between headline indicators and the sub-indicators as well as indicators for the international dimension. In annex 2 the data availability of these indicators for EU and OECD countries is recorded.

2. One of the main problems when building a sustainable development indicator (SDI) set is that it is hard to select indicators which are relevant for a wide set of countries. Especially concerning the current quality of life issues, a dashboard for the European Union will for example be very different from one that is specifically designed for sub-Saharan Africa. The report does not aim to present the reader a one-size-fits all SDI set, as it might be too much of a straight jacket in which indicators need to be 'squeezed' in an unnatural and unsatisfactory way. It was attempted to arrive at an approach in which dashboards for different parts of the world are comparable in the themes that are relevant, but flexible enough to address the issues which are of particular interest for the regions or countries in question. This is why in the discussion below, we clearly identify if there are country specific indicators conceivable.

3. It is important to realize that the themes are therefore 'universal', however the actual indicators that are used to describe the themes may be different in different countries. This approach will enable the user to monitor sustainable development world-wide by looking at the same themes and policy areas, but in a way which does justice to country or region specific factors.

4. In the list we identify headline and sub-indicators. The sub-indicators provide insight into how the headline indicators can be influenced and are therefore relevant for policy makers.

## I. Wellbeing

### A. All countries

5. *Headline:* An overall measure of the wellbeing of the population is required. In practice this is derived from a questionnaire in which the "life satisfaction" is surveyed. Overall, these are preferred over indicators that survey the "happiness" of respondents.

## II. Consumption

### A. All countries

6. *Headline:* The Stiglitz report emphasized the use of income and consumption measures and also to measure these from the perspective of the household. We therefore propose to use adjusted consumption per capita, including government consumption.

### **III. Income**

#### **A. Developed countries**

7. *Headline:* The Stiglitz report recommends the use of net national income and household income measures.

8. *Sub-indicators:* Since GDP is a measure of economic activity it is an important driver of income growth. Also it would be useful to measure productivity (labour, capital and multifactor-productivity as sub indicators for this theme).

9. *International:* Here the direct income measures from the developed world to the developing countries can be used (e.g. Official Development Assistance (ODA) and remittances).

#### **B. Developing countries**

10. *Headline:* For developing countries it is probably good to have specific measures on poverty.

### **IV. Nutrition**

#### **A. Developed countries**

11. *Headline:* The Maslow hierarchical structure obviously has an important place for food. However, the problem of under nourishment is not of major concern in the developed countries. Therefore, high-income countries may decide not to use this theme in their dashboards. In fact our analysis of commonalities shows precisely this. The problem of obesity, which is related to nutrition, is a sub-indicator for health rather than a good reflection of the importance that food plays in Maslow's pyramid.

#### **B. Developing countries**

12. *Headline:* For the developing countries the issue of under nourishment and even starvation are truly important indicators of sustainable development. Conceptually an indicator is required which shows the deficit between a balanced diet (both in terms of calories as well as vitamins and minerals) and the actual diet which the population gets.

### **V. Health**

#### **A. All countries**

13. *Headline:* The indicator should provide a summary value for the total physical and mental health of the population. The analysis of commonalities between SDI indicators shows that nearly all countries use the life expectancy of healthy life expectancy. Although this is not the perfect measure of physical health, it is used in SDI sets very often because of the abundant data (both in space and time). Similarly, the suicide rate seems to be used by many countries as sort of proxy for mental wellbeing of the population.

14. *Headline (Human Capital)*. This indicator should show the potential “stock of physical and mental health” which is present in population. It would show the number of years in good health that can be expected in future. For example, a number of indicators exist in the literature which tracks the “remaining healthy life years”. This is also sometimes referred to as “years of healthy life remaining”.

15. *Sub-indicators*: The level of health expenditures is an obvious sub indicator. However, lifestyle indicators (obesity, smoking, drinking and sports) are clearly also important driving forces for overall physical and mental health.

## **B. Developing countries**

16. *Sub-indicators*: Apart from the above sub-indicators one might also have some indicators which are specific for the health situation in developing countries. Examples include: the prevalence of physicians and hospital beds per person but also indicators that are related to major diseases such as HIV/AIDS and malaria.

## **VI. Housing**

### **A. All countries**

17. *Headline*: Here, we are looking for an overall measure of the quality of the dwellings that people live in. Of course, the housing conditions are multifaceted and difficult to measure in a single measure. Indicators that come close are the living space (square meters per person) or the number of dwellings without deficiencies (leaking roofs etc.).

18. *Sub-indicators*: Sub-indicators include the investment in dwellings, the affordability as well as the availability of dwellings (i.e. what percentage of the population wants to move but is unable to find an appropriate dwelling).

### **B. Developing countries**

19. *Headline*: In developing countries it is probably good to have indicators about people with inadequate housing (slum dwellers, homeless people (children)).

## **VII. Education**

### **A. All countries**

20. *Headline*: For the quality of life aspects of education we are looking for the average level of competencies and education. Happiness literature has shown that life satisfaction grows as these characteristics grow in the population. The level of skills and competencies goes beyond education but these indicators are regularly used (Educational attainment of population). There are however also measures of competencies such as PISA scores (for youngsters) as well as PIAAC scores (for whole population). The measurement of these indicators is organised by the OECD.

21. *Headline (Human Capital)*: see Labour

22. *Sub-indicators:* As sub-indicators one might use the expenditures on education as well as indicators that threaten the overall educational level of the population (e.g. early school leavers).

## **B. Developing countries**

23. *Headline:* In the developed world, access to education is more or less universal. This is not the case for the developing world where it would be good to measure enrolment rates at every level of education.

## **VIII. Leisure**

### **A. All countries**

24. *Headline:* Here we would want to measure the quantity and quality of leisure. In practice it is hard to measure the quality of leisure but it is possible to measure the time spent on leisure through time use surveys.

## **IX. Inequality**

### **A. All countries**

25. *Headline:* There are many types of inequality in societies. There may be overall income inequality, gender inequality, inequality in educational attainment etc. For each type there are proxy indicators such as the Gini coefficient available.

## **X. Physical safety**

### **A. All countries**

26. *Headline:* Here one would want to measure the overall level of crime. However, the severity of the crimes may vary significantly and so it is conceptually problematic to come to a single indicator. Nevertheless there are indicators for the amount of personal crimes or violent crimes that may be used.

27. *Sub-indicators:* Here one might want to measure expenditures of policing or the number of police staff.

### **B. Specific countries**

28. *Headline:* Some countries experience natural hazards, which is obviously also important for the physical safety.

## **XI. Trust**

### **A. All countries**

29. *Headline:* Here we want to measure the quality and quantity of social relationships (generalized trust), trust within subsections of society (family/neighbourhood) as well as the trust between groups in society (bridging social capital). In practice, these are very difficult concepts to measure. To measure overall trust, the indicators of generalised trust are often used (respondents are asked whether they trust other members of society). There are also social survey questions that can be used for family and neighbourhoods. Finally, bridging social capital may be answered by certain questions that indicate social exclusion (e.g. discrimination).

30. *Sub-indicators:* Here the investment perspective is important. We can track the time spent on family, friends and volunteering.

## **XII. Shared norms and values**

### **A. All countries**

31. *Headline:* Here one would want to measure the extent to which the members of the population share crucial norms and values. We know of no indicators to measure this phenomenon.

## **XIII. Institutions**

### **A. All countries**

32. *Headline:* An indicator of the quality of the institutions in society. This is of course very difficult because the institutions are very heterogeneous. There are however overall indicators in which the general public are asked to assess the quality of institutions in their country. Also the work of De Soto is very useful because it measures the time it takes to overcome bureaucratic procedures.

### **B. Developing countries**

33. *Headline:* In the case of developing countries it may be good to add indicators for the level of corruption.

## **XIV. Land**

### **A. All countries**

34. *Headline:* Here the area and value of land are in question. Although it does provide useful insights about the population density in a country, the development of this index is, of course, rather interesting. It is therefore conceivable that countries leave this indicator out of the SDI set.

35. *International dimension:* An interesting aspect of land is that, through our consumption, we are implicitly using land of other countries. This is also the guiding philosophy of the ecological footprint. In our dashboard for the international dimension we attribute the land use to consumption and the land “balance of trade”.

## **XV. Energy reserves**

### **A. All countries**

36. *Headline:* Here the total physical and monetary stock of energy reserves are in question. The measurement of these will be covered by the SEEA-2012.

37. *Sub-indicators:* The extraction and discoveries are important sub-indicators. Also the energy use, energy intensity and share of renewables are very relevant.

38. *International dimension:* For the international dimension we can track the direct imports from other countries as well as the “energy embodied in consumption” and the “balance of trade” (see land).

## **XVI. Metal and non-metal reserves**

### **A. All countries**

39. *Headline:* Here the total physical and monetary stock of metal and non-metal reserves are in question. The measurement of these will be covered by the SEEA-2012.

40. *Sub-indicators:* The extraction and discoveries are important sub-indicators. Also the material use, intensity and waste are very relevant.

41. *International dimension:* see energy

## **XVII. Ecosystems**

### **A. All countries**

42. *Headline:* An overall measure of state of biodiversity is very difficult. The Task Force has not yet identified a way forward.

43. *Sub-indicators:* Here the indicators on extinctions or threatened species as well as the land area for forest and nature may be used.

## **XVIII. Soil quality**

### **A. All countries**

44. *Headline:* The soil quality of a country varies and it is therefore difficult to measure a country average. However, it is possible to measure the quality of the soil in terms of the stock of pollutants such as nitrates and phosphates in the soil.

45. *Sub-indicators:* The emissions to soil should be measured.

**B. Developing countries**

46. *Headline:* For developing countries, the issue of erosion may be very relevant.

**XIX. Water quality**

**A. All countries**

47. *Headline:* The overall quality of water is again very difficult but can be approached using the stock of pollutants. Also the Biochemical Oxygen Demand (BOD) index is often used.

48. *Sub-indicators:* The emissions to water are relevant

**XX. Water quantity**

**A. All countries**

49. *Headline:* Here the overall amount of (fresh) water is meant. The SEEA admits that for many countries, where water is not a scarce commodity, this may not be a very relevant indicator.

50. *Sub-indicators:* The extraction and use of water would be appropriate sub-indicators.

51. *International dimension:* Here we can calculate the “water footprint” (see land)

**B. Developing countries**

52. *Headline:* Specific information about the access to water is important since this is not a universal resource for all citizens in the developing world.

**XXI. Air quality**

**A. All countries**

53. *Headline:* The overall air quality is difficult to measure but measuring certain pollutants that affect health provides a good proxy (Particulate matter, tropospheric ozone).

54. *Sub-indicators:* The emissions of these pollutants.

**B. Selected countries**

55. *Headline:* In some countries smog may be an common phenomenon.



## XXII. Climate

### A. All countries

56. *Headline:* Since this a global stock it should be measured by the CO<sub>2</sub> concentration or the global temperatures. Also the state of the ozone layer would be a good indicator for this problem. If one wants to assign a national responsibility to the reductions in these capital stocks one would need to see what the accumulated emissions are. For example, using the CDIAC database one could calculate the historical CO<sub>2</sub> emission of country.

57. *Sub-indicators:* Here the emissions and intensity of greenhouse gas emissions (and ozone precursors) should be measured.

58. *International dimensions:* Here the embodied carbon in consumption and the “carbon balance of trade” can be measured (see land).

## XXIII. Labour

### A. All countries

59. *Headline:* The largest impact on quality of life is of course the fact that one has job or not. Therefore the unemployment rate seems to be a good indicator for this dimension.

60. *Headline (Human capital):* With respect to measuring the capital stock we want to know what the potential labour volume is in future. This therefore means that we want to extrapolate the number of hours that will be worked towards the future. We can do this by looking at the current working hours, labour participation and pollution pyramid to estimate how much work we can expect in future. This exercise would in a sense be a sort of non-monetary Jorgenson-Fraumeni approach. Ideally one would also want to correct for the relative productivity in those hours. This could be done through the monetary Jorgenson-Fraumeni or by providing other weights for the relative productivity. However these measures are not available for a large number of countries so we can take the hours worked and the participation rates as non-monetary proxies.

61. *Sub-indicators:* Additional indicators on the labour market, such as the “average exit age from labour market” may be useful here.

### B. Developing countries

62. *Headline:* For some developing countries the working conditions will also be of influence on the quality of life. Indicators for working conditions and child labour may be useful.

## XXIV. Economic security

### A. All countries

63. *Headline:* The ability to have an income in future is an important component in the quality of life surveys. Indicators for the sum total of assets of household (house ownership, savings) may be useful as well as the pension reserves.

64. *Sub-indicators:* Pension payments and household savings may be good sub-indicators.

## **XXV. Physical capital**

### **A. All countries**

65. *Headline:* This capital stock should provide a summary value of the stock of machines, buildings and infrastructure. The methods do to this are summarized in the handbook on “Measuring Capital” (OECD)

66. *Sub-indicators:* Overall gross capital formation (investment) or specific investments (ICT) may be used.

### **B. Developing countries**

67. *Headline:* For developing countries it may be useful to measure some non-monetary aspects: length of paved roads, railways, number of mobile phones, internet connections

## **XXVI. Knowledge capital**

### **A. All countries**

68. *Headline:* Here the total stock of knowledge should be measured. Although innovation is far broader, the stock of R&D capital is often taken as a proxy. The conceptual aspects of measuring this capital type are currently being developed in the wake of the SNA 2008.

69. *Sub-indicators:* R&D investments (public and private may be useful summaries). Also other indicators for innovation may be used.

## **XXVII. Financial capital**

### **A. All countries**

70. *Headline:* Here the national totals of assets minus liabilities from the SNA may be used.

71. *Sub-indicators:* Specific forms of debt, such as government or household debt may be used.

## **XXVIII. Monetary values of the capital stocks**

### **A. All countries**

72. *Headline:* For these indicators the monetary values for economic and financial capital, human capital, natural capital and social capital are used. The methodology can be derived from handbooks (SNA, SEEA, Measuring capital (OECD)). However in some

cases, natural and social capital, methods are problematic or non-existent respectively. The “Economic Wealth” aggregate is the sum of these capital stocks.

73. *Sub-indicators:* Investments in these capital stocks.





	Indicator	Source	global	Australia	Austria	Belgium	Bulgaria	Canada	Chile	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Iceland	Ireland	Israel	Italy	Japan	Korea	Latvia	Lithuania	Luxembourg	Malta	Mexico	Netherlands	New Zealand	Norway	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	Switzerland	Turkey	United Kingdom	United States					
INT-H3-Income	Official Development Assistance (% of GNI)	Eurostat		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D			
<b>Natural capital</b>																																																
INT-NC1. Land	Embodied land use trade balance																																															
INT-NC2. Energy reserves	Embodied energy trade balance																																															
INT-NC2. Energy reserves	Energy imports (tonnes)	Eurostat,OECD, UN		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
INT-NC3. Metal and non-metal reserves	Embodied (non)metal trade balance																																															
INT-NC3. Metal and non-metal reserves	Metal and non-metal imports (tonnes)	Eurostat,OECD, UN		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
INT-NC7. Water quantity	Embodied water trade balance																																															
INT-NC8. Climate	Embodied GHG trade balance																																															

D data available annually  
 V data available variable

ESS European Social Survey  
 Survey by European Commission

BP British Petroleum  
 MTUS Multinational Time Use Survey

WHD World Happiness Database

Table A2.  
Policy classification

	Indicator	Source	Global	Australia	Austria	Belgium	Bulgaria	Canada	Chile	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Iceland	Ireland	Israel	Italy	Japan	Korea	Latvia	Lithuania	Luxembourg	Malta	Mexico	Netherlands	New Zealand	Norway	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	Switzerland	Turkey	United Kingdom	United States						
Wellbeing	Life satisfaction (score)	Euro-barometer, WHD		V	D	D	D	V	D	D	D	D	D	D	D	D	D	D	D	D	D	V	V	D	D	D	D	D	V	D		V	D	D	D	D	D	D	D	D	D	D	D	V					
Consumption	Household consumption (Euro)	Eurostat, OECD		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D			
Income	Net national income (Euro)	Eurostat, OECD		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D			
	GDP (Euro)	Eurostat, OECD		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D		
	Labor productivity (growth rate)	Eurostat, OECD		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	
	Multifactor productivity (growth rate)	Eurostat, OECD		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	
Nutrition	Obesity	Eurostat			D	D	D		D	D	D	D	D	D	D	D	D	D	D	D	D	D			D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D		
Health	Healthy life expectancy (years)	Eurostat			D	D	D		D	D	D	D	D	D	D	D	D	D	D	D	D	D			D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D		
	Life expectancy (years)	Eurostat, OECD		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	
	Suicide death rate (deaths per 100,000)	Eurostat, OECD		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	Expenditures on health (Dollars PPP)	OECD		D	D	D		D	D		D	D		D	D	D	D	D	D	D	D	D	D			D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	
	Smoking (%)	Eurostat, OECD		V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
	Obesity (5)	Eurostat, OECD		V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Housing	Living without housing deprivation (%)	Eurostat			D	D	D		D	D	D	D	D	D	D	D	D	D	D	D	D	D			D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D		
	Investments in housing																																																
	Availability																																																
	Affordability																																																
Education	Educational attainment (% of pop. with higher sec. edu.)	Eurostat, OECD		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	Competencies (PISA)	OECD		V	V	V		V	V		V	V		V	V	V	V	V	V	V	V	V	V			V		V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	
	Expenditures on education (% of GDP)	Eurostat, OECD		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	Educational attainment of young adults (% young adults)	Eurostat			D	D	D		D	D	D	D	D	D	D	D	D	D	D	D	D	D			D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D		
	Early school leavers (% of young adult not in school)	Eurostat		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	
Leisure	Time spent on recreation (hours)	MTUS		V	V		V				V		V	V	V							V							V		V														V	V			
Inequality	Inequality (income quintile/Gini)	Eurostat, OECD		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	
Physical safety	Victim of burglary/assault (% of households)	Eurostat			D	D	D		D	D	D	D	D	D	D	D	D	D	D	D	D			D			D		D																	D			
	Expenditures on safety (%)																																																
Trust	Generalised trust (Score)	ESS			D	D			D	D	D	D	D	D	D	D	D	D	D	D	D				D				D																		D		
	Bridging social capital indicator (% discriminated)	ESS			D	D	D		D	D	D	D	D	D	D	D	D	D	D	D	D				D		D		D																		D		
	Satisfaction with family life	ESS			V	V	V			V	V	V	V	V	V	V	V	V	V	V	V				V		V	V	V	V																	V		







## **XX. Structure of the full report of the Task Force on Measuring Sustainable Development**

### **A. Part 1: executive summary and recommendations**

### **B. Part 2: short narrative**

Basically an update of the summary as presented in this document

### **C. Part 3: TFSD final report**

#### **1. Section 1. Conceptual framework**

Introduction

Perspectives on sustainable development

#### **2. Section 2. Measuring sustainable development**

Introduction

Measuring human wellbeing

Measuring capital (economic, human, natural and social capital)

Measuring economic wealth

Measuring the international dimension

#### **3. Section 3. Sustainable development indicators**

Introduction

An SDI proposal

Visualisation and dissemination

#### **4. Section 4. Conclusions**

Conclusions, recommendations and future work

### **D. References**

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