

Research and development expenditures in regions

Expenditures and personnel employed in research and development (R&D) are common proxies to measure a region's investment in innovation.

Expenditure in R&D is highly concentrated in a limited number of regions, and is also due to different R&D efforts in different economic sectors. In 2010, one-third of total R&D expenditure of 26 OECD countries was performed by just 10% of regions. Large regional concentration of R&D is found both in countries with high R&D intensity (the ratio between R&D and GDP) such as France, Canada, Korea and the United States, and in countries with low R&D expenditure such as Poland, Spain and Hungary (Figure 2.42). Therefore, within country dispersion in regional R&D efforts is not a positive or negative feature per se; it needs to be evaluated along with aggregate national performance and the specificity of the country in question.

In 2010, R&D intensity was, on average, 2% in the OECD area, ranging from 4% in Finland to less than 0.5% in Chile. Within country differences in R&D intensity were larger than among countries in almost one-third of the countries (Figure 2.43). The United States, Korea, Denmark and France show the largest regional disparities in R&D intensity across TL2 regions. The regions with the highest R&D intensity are in most of the countries' urban regions hosting the capital city (Figure 2.43).

Regional differences in the share of employment in R&D were the largest in the Czech Republic, Denmark and Austria where, in the regions of Prague, Hovedstaden and

Definition

According to the *Frascati Manual*, 2002, R&D is a "creative work undertaken on a systematic basis in order to increase the stock of knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications".

Gross domestic expenditure on R&D (GERD) is the total intramural expenditure on R&D performed in the region or country during a given period. Intramural expenditures are all expenditures for R&D performed within a statistical unit or sector of the economy during a specific period, whatever the source of funds (see *Frascati Manual* sections 6.2, 6.6 and 6.7.1).

Gross domestic expenditure on R&D is disaggregated in four sectors: business enterprise (BERD), government, higher education and private non-profit.

R&D personnel includes all persons employed directly in R&D activities such as researchers and those providing direct services such as R&D managers, administrators, and clerical staff. Data are expressed in headcounts.

R&D intensity is defined as the ratio between R&D expenditure and GDP.

In the maps, a regional R&D intensity is defined as strong (weak) if it is above (below) the OECD median; the share of business R&D expenditure is labelled as private (public) if it is above (below) the OECD median share.

Vienna, respectively, there were more than 40 persons per 1 000 employed in R&D in 2010, two times higher than the country average (Figure 2.44).

In 2010, R&D performed by the business sector was around 60% of the total R&D in the OECD area. The largest differences with the respective country average are found in the regions of Nordwestschweiz (Switzerland), Eastern (United Kingdom) and Washington, D.C. (United States) (Figure 2.45).

Around 40% of the regions display R&D expenditure intensity and share of business expenditure higher than the OECD median regional values. These regions are in North-central Europe and along the coasts in Canada and the United States (Figures 2.46-2.47).

Source

OECD (2013), *OECD Regional Statistics* (database), <http://dx.doi.org/10.1787/region-data-en>.

See Annex B for data sources and country-related metadata.

Reference years and territorial level

2010, TL2.

No regional data for Iceland, Japan, Mexico, New Zealand and Turkey. Switzerland only BERD; in addition, R&D personnel data are not available for Israel, Australia and the United States.

Further information

OECD (2011), *Regions and Innovation Policy*, OECD Reviews of Regional Innovation, OECD Publishing, <http://dx.doi.org/10.1787/9789264097803-en>.

OECD (2002), *Frascati Manual 2002: Proposed Standard Practice for Surveys on Research and Experimental Development*, The Measurement of Scientific and Technological Activities, OECD Publishing, <http://dx.doi.org/10.1787/9789264199040-en>.

OECD Main Science and Technology Indicators: www.oecd.org/sti/msti.

Interactive graphs and maps: <http://rag.oecd.org>.

Figure notes

2.42-2.43: 2009 France, Austria, Germany, Denmark, Sweden, United Kingdom, Australia, Netherlands and Belgium; 2011 Czech Republic and Slovak Republic; 2005 Greece; 2008 Israel.

2.44: 2009 Austria, Germany, Denmark, Sweden, United Kingdom, Netherlands and Belgium; 2011 Slovak Republic and Czech Republic; 2001 France; 2005 Greece.

2.45: The Finland region of Etelä-Suomi refers to Etelä-Suomi and Helsinki-Uusimaa.

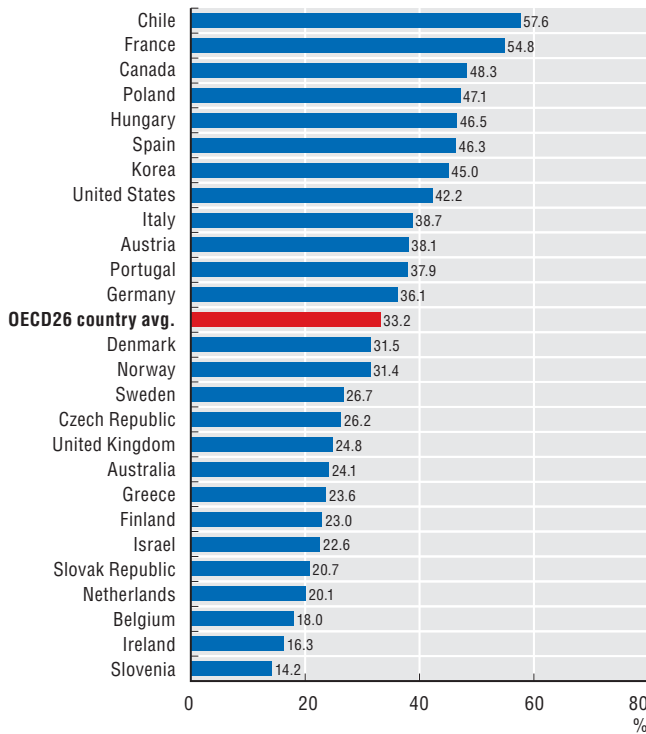
2.46-2.47: Regions are classified as strong (weak) if their R&D intensity is above (below) the OECD median value; and private (public) if the share of BERD on total R&D expenditure is above (below) the OECD median value.

Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>.

2. REGIONS AS DRIVERS OF NATIONAL COMPETITIVENESS

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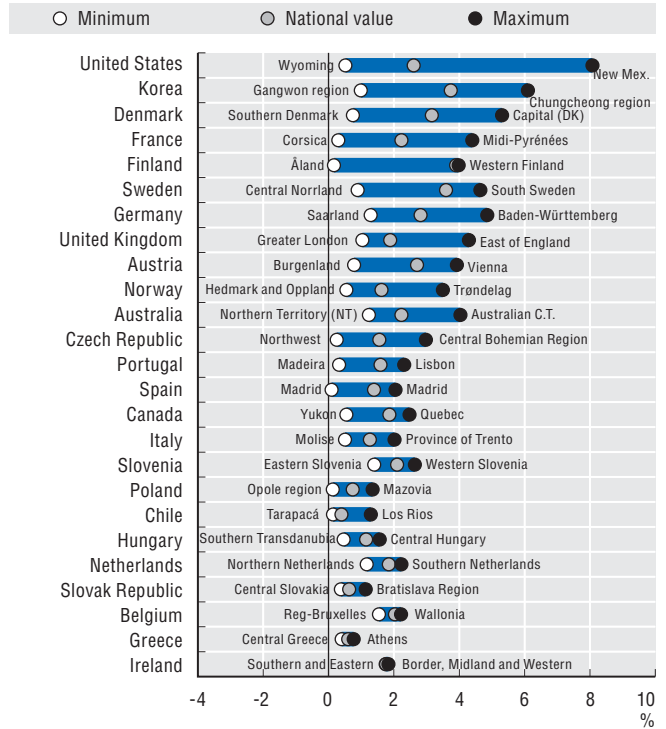
2.42. National R&D expenditure concentration by top 10% TL2 regions with largest R&D expenditure, 2010



StatLink <http://dx.doi.org/10.1787/888932913760>

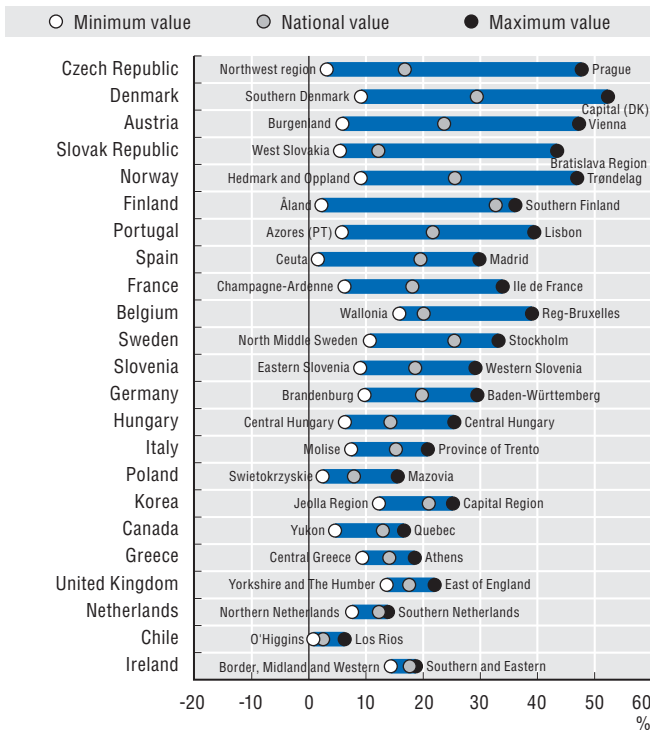
2.43. Range of TL2 regional R&D intensity, 2010

R&D expenditure over GDP, %



StatLink <http://dx.doi.org/10.1787/888932913779>

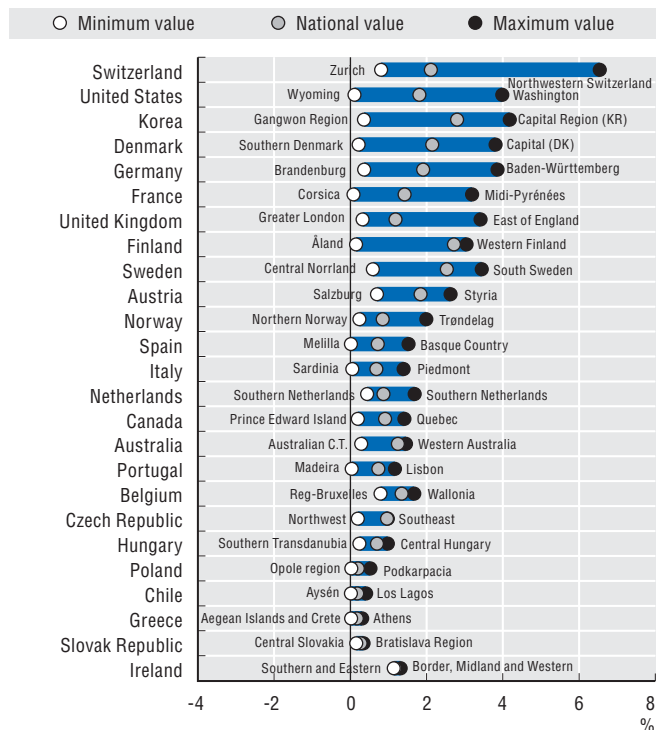
2.44. Range of TL2 regional R&D personnel per 1 000 employees, 2010



StatLink <http://dx.doi.org/10.1787/888932913798>

2.45. Range of TL2 regional business R&D intensity, 2010

Business R&D expenditure over GDP, %



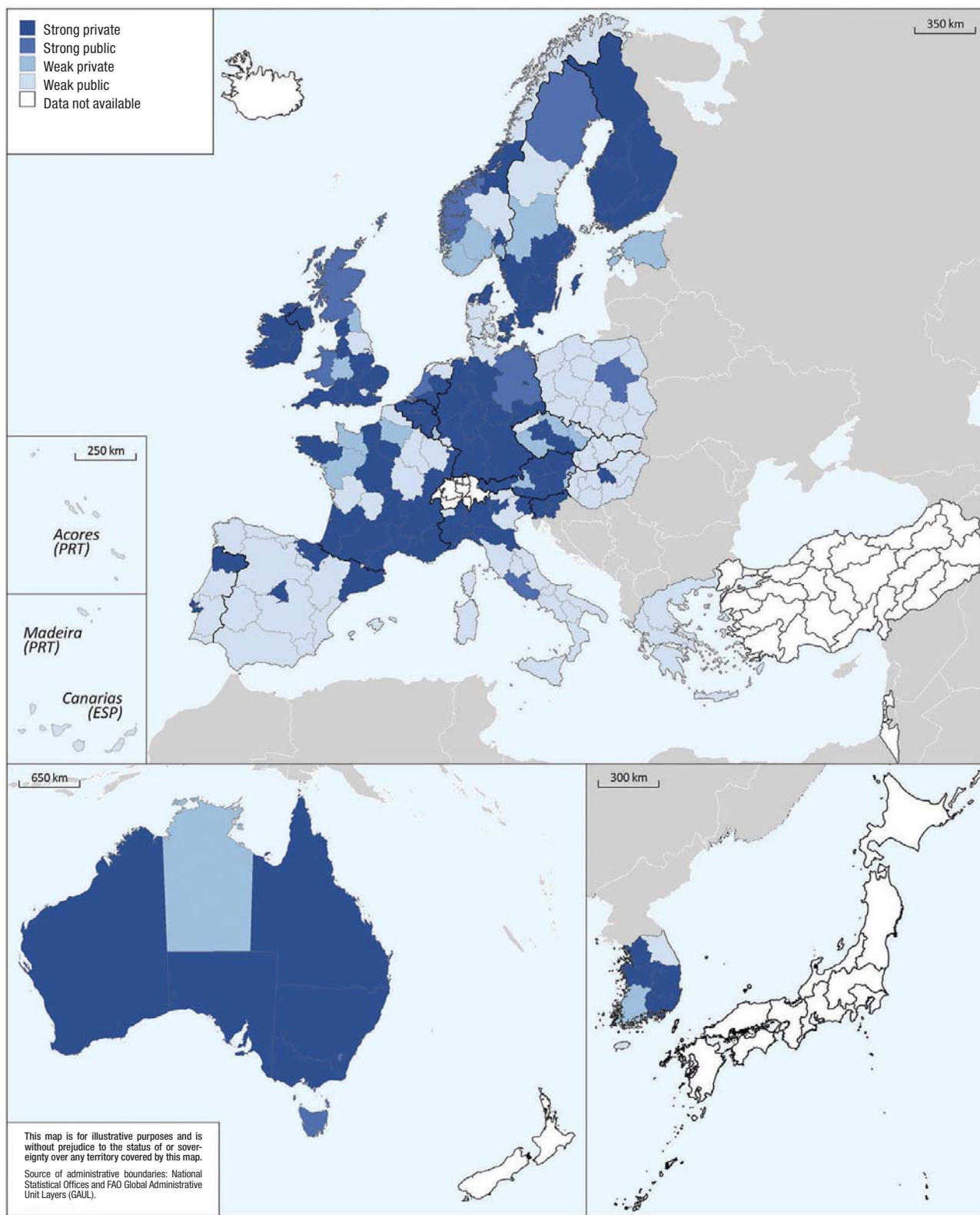
StatLink <http://dx.doi.org/10.1787/888932913817>


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2.46. Regional R&D intensity and share of business R&D: Asia, Europe and Oceania

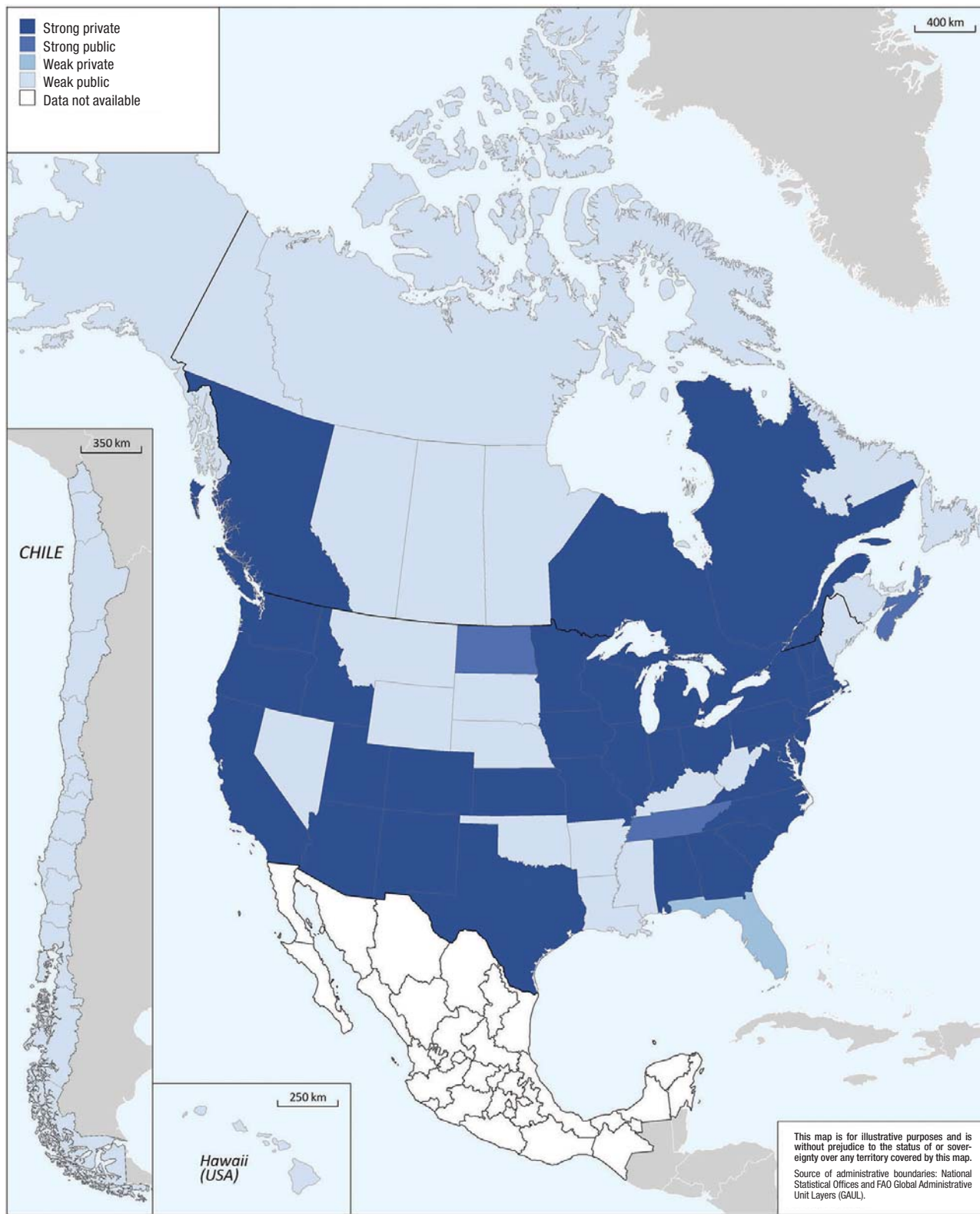
TL2 regions, 2010




StatLink  <http://dx.doi.org/10.1787/888932915565>

2.47. Regional R&D intensity and share of business R&D: Americas

TL2 regions, 2010



StatLink  <http://dx.doi.org/10.1787/888932915584>



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