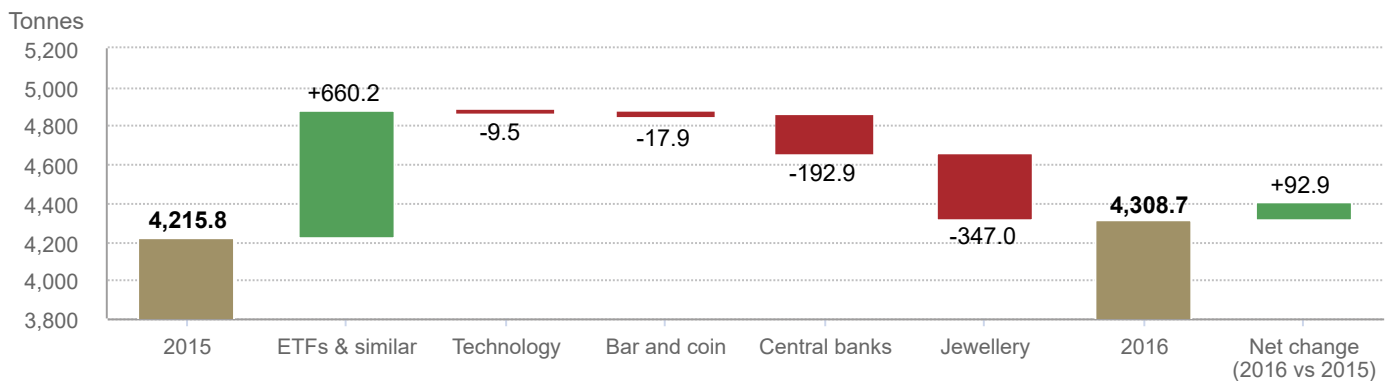


## A four-year high in investment drove price gains and demand growth

**2016 full-year gold demand** gained 2% to reach a 3-year high of 4,308.7t. Annual inflows into ETFs reached 531.9t, the second highest on record. Declines in jewellery and central bank purchases offset this growth. Annual **bar and coin demand** was broadly stable at 1,029.2t, helped by a Q4 surge.

### Change in annual gold demand, 2016 v 2015



Source: Metals Focus; World Gold Council

### Highlights

**2016 was the second best year for ETFs on record.** Global demand for gold-backed ETFs and similar products (ETFs) was 531.9t - the highest since 2009. Q4 saw outflows.

**Bar and coin demand sprang into life in Q4.** Having been subdued for most of the year, the price fall in Q4 was the buying opportunity many retail investors had been waiting for. Q4 was China's strongest quarter for bar and coin demand since Q2 2013.

**The gold price ended the year up 8%.** Having risen 25% by the end of September, gold relinquished some of its gains in Q4 following Trump's conciliatory acceptance speech and the FOMC's interest rate rise.

**2016 saw a 7-year low for jewellery demand.** Rising prices for much of the year, regulatory and fiscal hurdles in India and China's softening economy were key reasons for weakness in the sector.

**India's shock demonetisation policy brought the market to a virtual standstill.** An initial rush for gold following the policy announcement came to a swift halt in the ensuing cash crunch.

**Central bank demand was the lowest since 2010.** Net purchases (383.6t) were 33% lower than 2015, due in part to increased pressure on FX reserves. Despite this, 2016 was the 7th consecutive year of net purchases by central banks.

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# Technology

## Gold demand in the technology sector declined 3% in 2016, as Q1 weakness weighed on performance.

	Tonnes	2015	2016	YoY
<ul style="list-style-type: none"> <li>Electronics demand fell 3% in 2016: first half losses outweighed end-of-year recovery</li> </ul>	<b>Technology</b>	332.0	322.5	▼ -3%
	Electronics	262.2	254.5	▼ -3%
<ul style="list-style-type: none"> <li>Annual demand declined in both the 'other industrial' and dental segments; Q4 saw an upturn in other industrial demand</li> </ul>	Other Industrial	50.9	50.0	▼ -2%
	Dentistry	18.9	18.0	▼ -5%

Despite an upturn late in the year, annual demand for gold in technology fell 3% in 2016, from 332.0t to 322.5t. Q1 weakness, caused by global economic uncertainty, higher gold prices and substitution, squeezed the full year total. Q4 was a bright spot, though: quarterly demand hit its highest level since Q2 2015.

## Electronics

**Gold used in electronics rose 4% y-o-y to 66.9t in Q4, boosted by increased demand for gold bonding wire and Printed Circuit Boards (PCBs).** While demand slowed in the LED and wireless sectors, rampant growth in the gold bonding wire and PCB industries lifted the quarterly total to positive territory.

Gold bonding wire benefited hugely from more widespread use of fingerprint and iris sensors. The latest smartphone models released by Samsung and Huawei use biometric data from eye scanning to enhance security and are widely regarded as industry trend setters. As a result, sensor makers in mainland China, Taiwan and South Korea were operating at full capacity and have since increased both prices and lead time to meet demand.

Gold used in PCBs grew in line with increased smartphone shipments in Q4. The impact of the growth in High Density Interconnects (HDIs), which reduce the volume of gold used in PCBs, was outweighed by the growth in shipments.

Demand from the LED and wireless industries paled in comparison. Increasingly, LED manufacturers are adopting more advanced packaging technology in vehicle lighting. Chip Scale Packaging (CSP), which can more easily withstand a vibrating environment, has size reduction and cost saving advantages. This miniaturisation reduced gold volumes. The wireless sector, on the other hand, slowed down largely due to seasonal factors.

**More new uses of gold are being uncovered.** Researchers from the Israel Institute of Technology have developed sensors made from gold nanoparticles, which can be used to [identify different diseases from a simple breath test](#).  
<sup>11</sup> Varying amounts of 13 volatile organic compounds are present in illnesses such as lung cancer and Parkinson's disease. The Institute's sensors could identify the specific disease 86% of the time after allowing for factors such as age and gender. Although not yet accurate enough for use in real-life diagnoses, there is genuine potential for this new technology to be an efficient, non-invasive way of detecting early-stage disease.

# Supply

## Total supply grew 5% in 2016, with pronounced year-on-year growth in recycled gold and net producer hedging.

- 2016 mine production was flat but there are signs of renewed interest in exploration
- Full year net producer hedging doubled to 26.3t
- Recycling rose 17% in 2016 as consumers responded to the higher price

Tonnes	2015	2016	YoY
<b>Total supply</b>	4,363.1	4,570.8	▲ 5%
Mine production	3,233.0	3,236.0	▲ 0%
Net producer hedging	13.5	26.3	▲ 95%
Recycled gold	1,116.5	1,308.5	▲ 17%

## Mine production

**Mined gold totalled 3,236t in 2016, virtually unchanged from 2015.** Production peaked in Q3, when 850.4t was brought on to the market, before falling back to 810.9t in Q4 (-2% y-o-y).

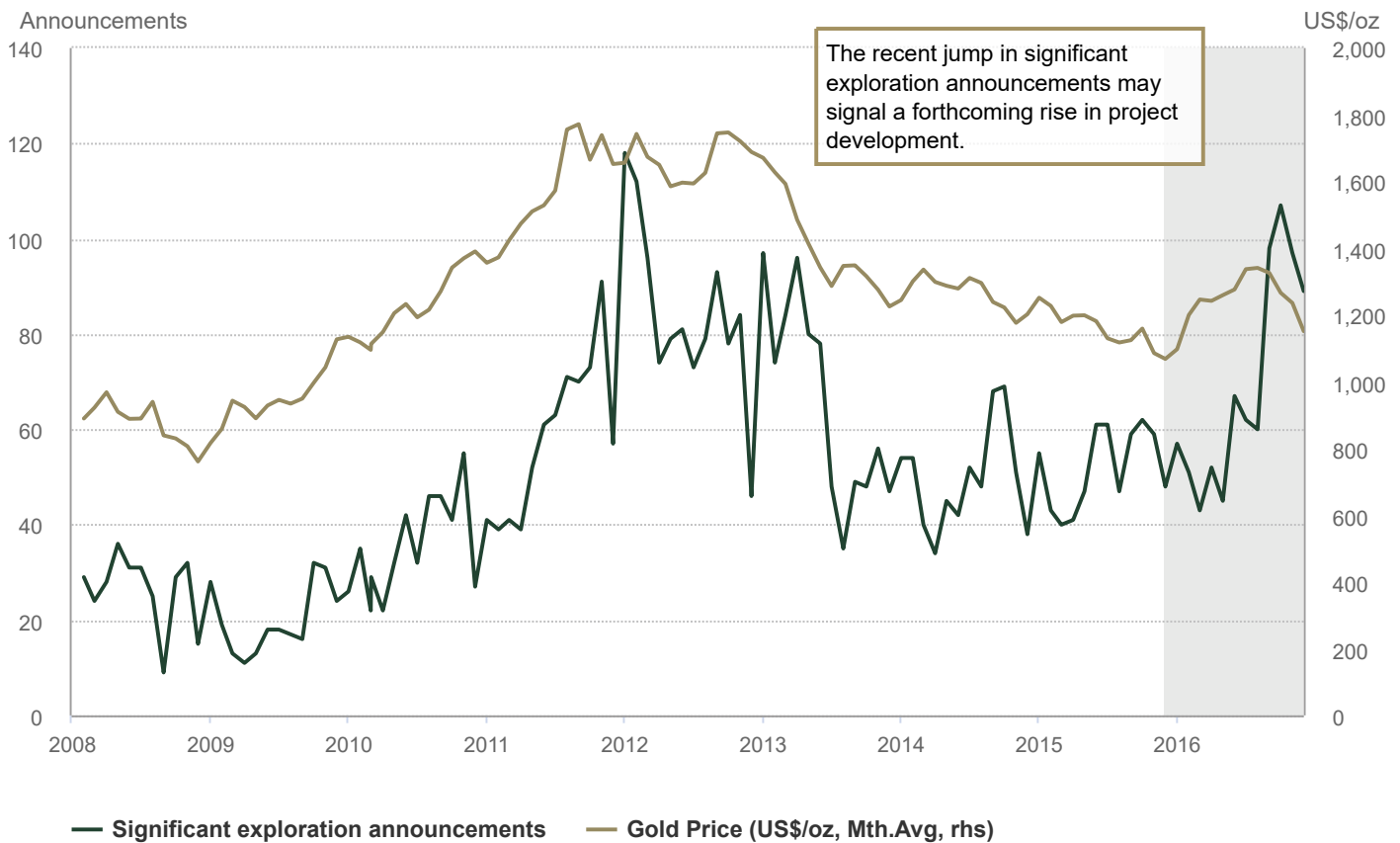
Indonesia saw the largest gains in Q4 (more than 7t y-o-y). This was due to the mining of higher-grade ore – something of a current industry trend – at Grasberg, which promises to boost Indonesian production further in 2017. Production in Suriname also grew in Q4 (3t y-o-y), as Newmont's Merian mine began commercial production in October.

Russian Q4 production (-6t y-o-y) was hit by flooding at some of the largest operations, while production in Mongolia fell by 5t y-o-y due to the mining of lower grade ore at Oyu Tolgoi. The Q4 decline in Mali (-4t y-o-y) was partly due to a comparison with a high base quarter.

**Plateauing production is inevitable given industry cost-cutting since 2013.** Gold miners recognise that the capital-intensive nature of the industry is driven by two key factors: the costs of extracting gold from the ground, and the costs associated with replacing those gold reserves. Despite the need for strategic reserve levels to be maintained, the project pipeline is considerably thinner and exploration budgets were cut in recent years.

**But 2016 signalled a renewed vigour for exploration; increased project development may be around the corner.** Higher local gold prices, coupled with lower costs, allowed producers to reap higher margins. Coffers were boosted, providing opportunities for a pick-up in brownfield and, to a lesser extent, greenfield spending. In November, a Moody's report predicted that the higher average gold price in 2016 will spur an increase in capital spending over the coming year.<sup>12</sup> SNL Metals & Mining, in its recent Gold Mined Supply Report, also highlighted renewed interest in exploration in the latter part of 2016.<sup>13</sup> Acacia Mining is a prime example; it expects its 2017 greenfield budget to be around 15% higher than in 2016<sup>14</sup>, with CEO Brad Gordon telling Reuters<sup>15</sup>, "This is part of our long-term strategy to invest in exploration when the rest of the industry is walking away from that".

## Signs of renewed interest in exploration



Note: A significant exploration announcement refers to reported drill results which are flagged as being of a certain value - based on grade, interval width and the yearly nominal metal prices.

Source: SNL Metals & Mining; ICE Benchmark Administration; World Gold Council

**Increased exploration is unlikely to affect mine production anytime soon.** A greater focus on project development is understandable. Large-scale discoveries of gold are becoming rarer.<sup>16</sup> But the gold price will continue to dictate the speed of this development. What's more, given the long lead times involved, it is unlikely that new discoveries or major project developments will significantly impact annual production for the foreseeable future.

## Net producer hedging

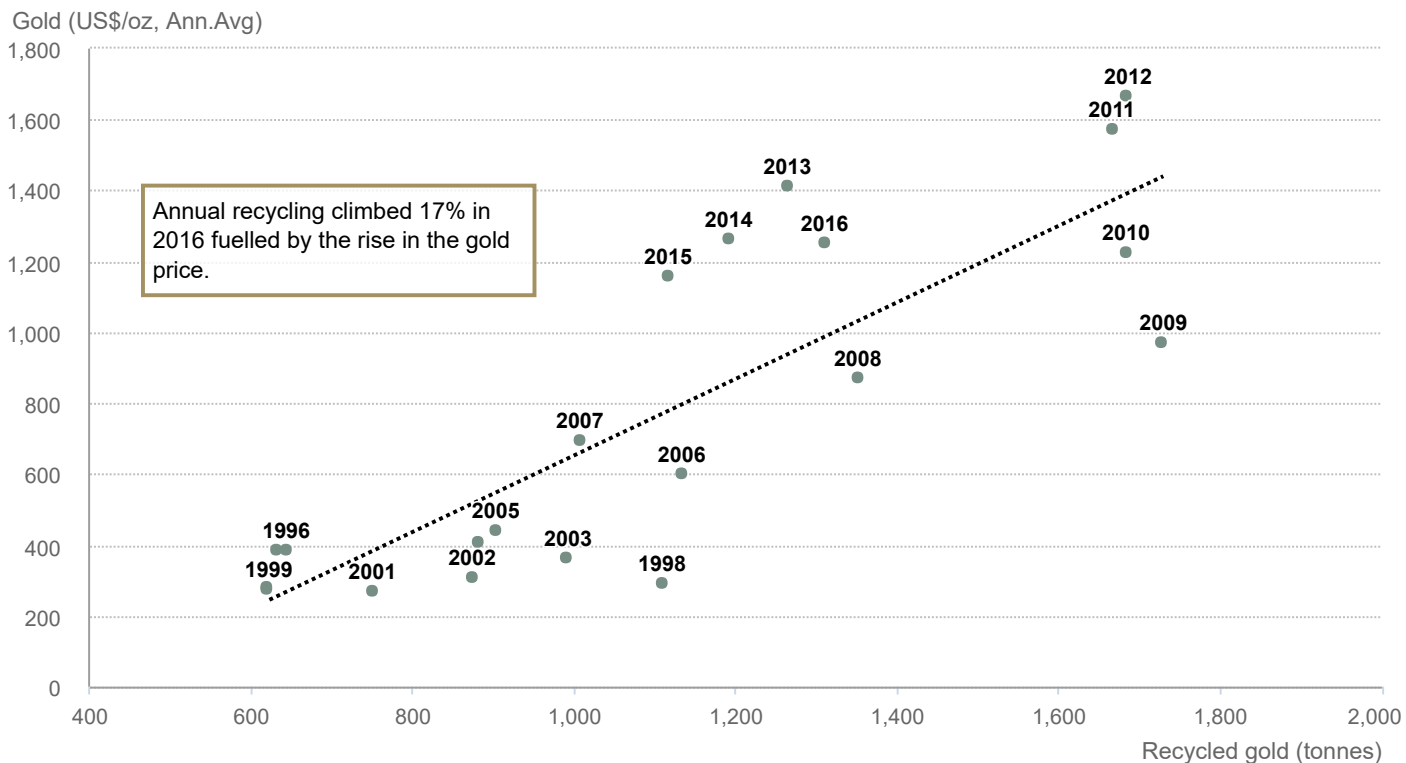
**2016 saw a near-doubling of annual net producer hedging, to 26.3t from 13.5t.** Gold producers, who have struggled with the falling gold price in recent years, saw an opportunity to secure cash flow at higher prices.

**The first and second halves of the year were polar opposites.** In the first half, net hedging was a feature of the market (70.4t), as strong price gains – around 25% by mid-year – prompted some miners to act. Currency movements had driven the gold price up to record levels in some key producer currencies. But in the second half of the year the price struggled to hold onto these gains, leading to a shift in tone with producers less keen to hedge in a falling price environment. Net de-hedging (of 44.1t) was a feature of Q3 and Q4.

## Recycled gold

**The growth in recycling in 2016, up 17% from 1,116.5t to 1,308.5t, was concentrated in the first three quarters.** At its peak, gold was almost 30% from end-2015 levels; these higher prices created an environment in which recycling thrived.

## Higher prices in 2016 boosted recycled supply



Source: Metals Focus; GFMS, Thomson Reuters; World Gold Council

**In Western markets, Q4 recycling volumes were 4% higher than Q4 2015, but 10% lower than Q3 2016.** The lower price in Q4 dented US recycling. But European recycling levels were healthier as a weaker euro supported the local gold price. The available pool of near-market supplies was also a factor, with some European markets, such as Spain and Italy, having a greater volume of available stock to recycle.

The Middle East saw a regional rise of 28% in Q4, predominantly due to Egypt, where currency weakness encouraged consumers to sell back. Turkey was a key exception, both regionally and globally: recycling fell in Q4 on the back of a [rallying cry by President Erdogan](#)<sup>17</sup> for Turks to forgo holding foreign currencies in favour of gold or the lira.

Recycling in India was hit by the government's shock demonetisation announcement, falling 36% y-o-y and 67% q-o-q in Q4. The liquidity crunch affected jewellers, who struggled to obtain cash to purchase gold from consumers, blocking a key recycling channel and resulting in a surge in gold-for-gold exchange. In East Asia, Q4 recycling was up 7% y-o-y, but down 44% from Q3 as the focus switched to buying gold ahead of the Chinese New Year (28th January).



## Footnotes

1. Read more: [indianexpress.com/article/business/business-others/demonetisation-jewellers-under-i-t-scanner-for-sub-rs-2-lakh-split-of-sales-4375907/](http://indianexpress.com/article/business/business-others/demonetisation-jewellers-under-i-t-scanner-for-sub-rs-2-lakh-split-of-sales-4375907/)
2. Read more: [www.ft.com/content/c9f7d320-dee7-11e6-9d7c-be108f1c1dce](http://www.ft.com/content/c9f7d320-dee7-11e6-9d7c-be108f1c1dce)
3. Read more: [www.ipsos.com/sites/default/files/2016-12/Europe\\_in\\_2016.pdf](http://www.ipsos.com/sites/default/files/2016-12/Europe_in_2016.pdf)
4. For background information on the consumer response to October's price dip, please see [Gold Demand Trends, Third quarter 2016: Focus: Q4 update – impact of prices on consumer demand www.gold.org/supply-and-demand/gold-demand-trends/back-issues/gold-demand-trends-q3-2016/focus-q4-consumer-demand](http://www.gold.org/supply-and-demand/gold-demand-trends/back-issues/gold-demand-trends-q3-2016/focus-q4-consumer-demand).
5. For a definition of Tier 1 and 2 cities, refer to the glossary of 'China: progress and prospects [www.gold.org/supply-and-demand/chinas-gold-market-progress-prospects](http://www.gold.org/supply-and-demand/chinas-gold-market-progress-prospects)', World Gold Council, April 2014
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7. Read more: [vietnamnews.vn/economy/347555/ministry-of-public-security-to-trace-demonetisation-rumour-monger.html#YOiCxyyu44gUjjod.97](http://vietnamnews.vn/economy/347555/ministry-of-public-security-to-trace-demonetisation-rumour-monger.html#YOiCxyyu44gUjjod.97)
8. Read more: [www.gold.org/supply-and-demand/gold-demand-trends/back-issues/gold-demand-trends-q3-2016/central-banks](http://www.gold.org/supply-and-demand/gold-demand-trends/back-issues/gold-demand-trends-q3-2016/central-banks)
9. For Jordan: data is to end-October; for Venezuela: data is to end-September.
10. To end-November.
11. Read more: [www.engadget.com/2016/12/29/simple-breath-test-can-detect-cancer-and-16-other-diseases/](http://www.engadget.com/2016/12/29/simple-breath-test-can-detect-cancer-and-16-other-diseases/)
12. Read more: [www.moody's.com/research/Moodys-Gold-miners-to-invest-more-in-2017-making-project--PR\\_358521?WT.mc\\_id=AM%7eRmluYW56ZW4ubmV0X1JTQl9SYXRpbmdzX05ld3NfTm9fVHJhbnNsYXRpb25z%7e20161123\\_PR\\_358521](http://www.moody's.com/research/Moodys-Gold-miners-to-invest-more-in-2017-making-project--PR_358521?WT.mc_id=AM%7eRmluYW56ZW4ubmV0X1JTQl9SYXRpbmdzX05ld3NfTm9fVHJhbnNsYXRpb25z%7e20161123_PR_358521)
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