



xPd

Direct access to physical palladium,
stored in secure facilities



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INTRODUCTION

xPd gives holders direct access to physical palladium held in institutional grade vault storage. By combining a trust structure with Tezos-based smart contracts, xPd makes it possible to own, hold, and transfer palladium without the wrapper friction, creation unit minimums, and management fees of existing fund products, and without the storage and insurance overhead of physical bar ownership.

Palladium is one of the six platinum group metals (PGMs) and one of the rarest precious metals on Earth. Between 80% and 90% of palladium demand comes from the automotive industry, where it is used in catalytic converters to reduce harmful emissions from gasoline engines. The remainder is used in electronics, chemical catalysis, hydrogen separation membranes, medical devices, and jewellery. It has a unique demand profile that combines industrial necessity with the portfolio characteristics of a precious metal, and its supply is more concentrated geographically than any other major metal. Russia and South Africa together account for approximately 80% of global mined output.

This whitepaper sets out why we have brought palladium onto metals.io, how the xPd smart contract works, who the key partners are, and how xPd compares honestly to the alternatives already available to investors. Unlike some other metals on the platform, palladium is one where physical retail ownership is already established through coins, bars, and ETFs. The intent is to be straightforward about what tokenisation does and does not solve relative to those alternatives.

Why palladium, and why now

The following factors are relevant to understanding current palladium market dynamics.

The first is sustained supply concentration combined with persistent deficits. Global palladium supply has been in deficit since 2012, with shortfalls of approximately 0.9 million ounces in 2023 and 0.5 million ounces in 2024 according to industry analysts. Norilsk Nickel in Russia

accounts for around 40% of mined palladium, with Sibanye-Stillwater, Anglo American Platinum (now Valterra Platinum), and Impala Platinum in South Africa producing most of the rest. Both jurisdictions carry real operational risk: Russia faces ongoing sanctions and export restrictions, and South African operations have a documented history of electricity shortages, labour disputes, and weather-related disruption. Canada and the US contribute meaningfully smaller shares, and the closure of Lac des Iles in Ontario is expected in mid-2026, with the US primary producer scaling back output. New mine development is unattractive at current price levels and takes 8 to 12 years to reach production, meaning supply response is structurally slow.

The second is the changing shape of demand. The transition to electric vehicles is gradually reducing automotive palladium demand because battery electric vehicles do not require catalytic converters. The Johnson Matthey 2025 PGM Market Report forecasts a 5% reduction in automotive palladium demand in 2025, with the palladium market moving back into balance after several years of deficit. However, the picture is more nuanced than headline EV adoption rates suggest. Hybrid vehicles use 10% to 20% more palladium per car than standard internal combustion engine models because their engines cycle on and off, leaving catalysts spending more time in cold-start conditions. Stricter emissions standards under Euro 7, China 7, and US EPA Tier 4 (effective from 2027) are pushing up palladium loadings per vehicle. EV sales growth has slowed materially in Europe and the US, and hybrid sales are rising. The net effect is that palladium demand decline is more gradual than the simple EV transition narrative implies.

The third is the developing role of palladium beyond autocatalysts. Palladium-silver membranes achieve up to 99.999% purity in industrial hydrogen separation, and palladium-based alloys are being developed for proton-exchange membrane fuel cells. The International Energy Agency projects global hydrogen demand could reach 530 million metric tonnes annually by 2050 under net-zero scenarios. Combined with palladium's low correlation with broader commodity indices, this can provide a useful role as a portfolio diversifier within a precious metals allocation.

Sources: Johnson Matthey PGM Market Report May 2025; USGS Mineral Commodity Summaries; World Platinum Investment Council; UBS Precious Metals Outlook; Wood Mackenzie; European Commission JRC palladium supply security assessment; IEA Global Hydrogen Review.



THE PALLADIUM MARKET TODAY

The physical market and its frictions

Palladium has one of the more mature physical retail markets compared to other base and industrial metals. Investors can buy coins, bars, and a range of ETFs and ETPs that hold physical metal in LBMA-approved vaults. Wholesale physical palladium trades through the London Platinum and Palladium Market (LPPM), with NYMEX palladium futures providing exchange-traded price discovery. There is no shortage of routes into the market for retail investors with modest amounts to invest, and we are clear that xPd is not solving the access problem in the way xU3O8 did for uranium.

What xPd does address is a set of structural inefficiencies in the existing physical product market. Physical ETFs such as Aberdeen Standard Physical Palladium Shares (PALL) and Sprott Physical Platinum and Palladium Trust (SPPP) hold metal in LBMA vaults and offer the simplest equivalent product to xPd. Creation and redemption of fund units happens at the authorised participant (AP) level only, meaning that secondary market prices can drift from net asset value during volatile periods. Coins and bars give direct ownership but carry retail premiums over spot, storage and insurance costs if held by a third party, and meaningful bid-offer spreads on resale. NYMEX palladium futures give pure price exposure but require margin, broker accounts, and rolling discipline, and they are a synthetic rather than physical position.

xPd is positioned to offer direct beneficial ownership of physical palladium at any size, with the metal held in named LBMA-grade vault storage by Brinks, transferable on chain at any time. The fee structure works through the dilution mechanism described in Section 3 rather than as a stated management fee.

Other ways to gain palladium exposure

There are several existing routes for investors who want palladium exposure. Each solves a different problem and each has its own trade-offs. The table below sets out the main alternatives honestly.

Method	Direct physical ownership	Fractional sub-lot size	Management or wrapper fees	24/7 settlement
Nymex Palladium Futures	No (cash or delivery contract)	No (100oz contract)	No (margin and broker costs)	No
Physical ETFs (PALL, SPPP)	Indirect (fund unit)	Yes	Yes (typically c. 60bps)	No
PGM miner equities	No (equity exposure)	Yes	No	No

Method	Direct physical ownership	Fractional sub-lot size	Management or wrapper fees	24/7 settlement
Physical coins and bars	Yes	Limited (smallest unit 1oz typical)	Retail premium and storage costs	No
xPd	Yes (beneficial ownership)	Yes (No minimum)	Annual fee paid via dilution mechanism	Yes

The honest summary: investors who already hold PALL or SPPP and are happy with the wrapper structure will not find xPd revolutionary. What xPd offers is a different combination of features. It is direct beneficial ownership rather than a fund unit. It settles 24/7 rather than during exchange hours. It can be moved between approved wallets without needing to liquidate to fiat and rebuy. It can be used as on-chain collateral in lending markets or paired against other tokenised assets. For investors who hold digital assets alongside precious metals and want their palladium position to live in the same operational environment as the rest of their portfolio, xPd is the cleaner instrument. For investors who never plan to use those features, an ETF may continue to be the simpler choice.

Comparison is illustrative and reflects typical features of each instrument. Specific fees, lot sizes, and settlement terms vary by provider and venue. Investors should consult product documentation for each alternative.



SMART CONTRACT DESIGN

How the xPd smart contract works

xPd is designed so that holding a token on a Tezos wallet means holding a fractional beneficial ownership claim on physical palladium sitting in a secure vault. The structure follows the same English trust law framework that underpins xU3O8, with the trustee holding legal title to the palladium for the benefit of token holders.

The smart contract uses a layered ownership ledger. The primary layer records, in troy ounces, the total amount of physical palladium held by the trustee for beneficial owners. The secondary layer records the fractional ownership of each wallet holder in that pool. To pay the service providers that support storage, and administration, a treasury wallet is credited with fractional ownership on a daily basis. This works in a similar way to equity dilution in traditional markets and means that each user wallet's share of the underlying palladium reduces gradually over time as fees accrue. The annual fee schedule will be published and updated monthly.

The balance of xPd credited to a wallet represents proportional ownership of the physical palladium held in trust. The price of xPd is determined by supply and demand dynamics across approved trading venues. There is no formal peg to the LBMA palladium fix or to NYMEX palladium futures. Market makers and arbitrageurs accessing approved venues are expected to keep xPd broadly aligned with the underlying physical market, but xPd is not a synthetic tracker and there is no creation or redemption mechanism that forces a tight peg in real time.

Trading and transfer

Only approved wallets, either those of approved centralised exchanges or wallets that have been whitelisted for use in the dApp, can be used to acquire xPd. Trading in or out of xPd must happen at one of these approved venues. The approved trading venues act as price discovery

points. Investors who wish to take physical delivery can do so through a palladium custody account held with Brinks, subject to the standard minimum delivery sizes that apply at the vault level (typically a sponge bag or a small bar). For the avoidance of doubt, the absence of a minimum purchase size applies to xPd itself, not to physical redemption.

Fees

Annual fees cover vault storage, insurance, trust administration, and platform costs. These are accrued daily through the dilution mechanism described above, using the formula:

$$\text{Daily treasury credit} = (\text{Annual Fees} \div 365) \times \text{Aggregate User xPd Balances}$$

Because xPd gives investors direct beneficial ownership of physical palladium rather than exposure through a fund or special purpose vehicle, the structure removes management and SPV-level fees that are common to ETF wrappers. The intent is to be competitive with the published expense ratios of the leading physical palladium ETFs, with the additional features of 24/7 settlement and on-chain composability for no incremental fee. Investors should compare the published xPd fee schedule against the total expense ratios of the relevant ETFs at the time of investment.



KEY PARTNERS

The xPd arrangements depend on a small number of regulated counterparties, each with a specific role. We have chosen partners who are established in the precious metals market and who can evidence the underlying holdings.

<p>Brinks</p>	<p>Physical custodian of the underlying palladium, with material held in LBMA-grade vault storage. Brinks is one of the largest and most established precious metals vaulting operators in the world, providing the chain of custody, trail, and inventory reporting that underpins the trust arrangements.</p>
<p>Archax</p>	<p>FCA-regulated digital securities exchange and custodian, responsible for tokenisation, trustee account set-up, and RWA administration. Archax holds permissions in the UK for arranging deals in investments, custody, and operating a multilateral trading facility.</p>
<p>Trillitech</p>	<p>Lead Tezos ecosystem contributor responsible for the dApp, relevant integrations, and the wider technical ecosystem in which xPd trades. Trillitech is the primary engineering organisation supporting the Tezos protocol.</p>
<p>OTC Suppliers</p>	<p>Physical palladium is sourced through established OTC broker relationships with several supply counterparties. This is intentionally a multi-source arrangement to avoid single-supplier concentration and to provide flexibility on bar form, refiner, and origin.</p>
<p>Distribution Partners</p>	<p>Approved centralised exchanges and onboarding partners, who manage trading access, KYC and AML, and investor acquisition for the segments of the market they serve.</p>



IMPORTANT CONSIDERATIONS

This document is for informational purposes only and does not constitute an offer or invitation to buy any financial product. xPd may not be available in all jurisdictions and is subject to local regulatory restrictions.

Palladium is a precious metal with industrial applications. Its price is influenced by automotive demand and substitution trends, mining policy and operational performance in Russia and South Africa, broader macroeconomic conditions, currency movements, and investor sentiment toward precious metals as a whole. Palladium prices have historically been more volatile than gold or silver. Past performance is not indicative of future results.

The value of xPd can move down as well as up, and investors may not recover the amount they originally invested. The value of xPd may diverge from the LBMA palladium fix or NYMEX palladium futures during periods of market stress, low liquidity, or technical disruption at trading venues.

Forward-looking statements about market structure, supply, demand, and policy are based on third-party sources cited in this document and reflect those sources' views at the time of publication. They are not forecasts by the issuer and should not be relied upon as such.

Investors should read the full xPd product documentation, including the fee schedule, and consider taking independent financial and tax advice before investing.



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