PKRSC: The Pakistani Rupee Stablecoin for the Digital Economy

Contract Address: 0x220aC54E22056B834522cD1A6A3DfeCA63bC3C6e
Network: Base (Ethereum Layer-2)
Ticker: PKRSC
Peg: 1 PKRSC = 1 Pakistani Rupee (PKR)

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1. Introduction

Pakistan receives over **USD 30 billion annually in remittances**, a critical lifeline for millions of families and a major contributor to foreign reserves. Yet, the traditional remittance system remains slow, expensive, and inefficient — constrained by intermediaries, settlement delays, and high transaction costs.

PKRSC introduces a new paradigm: a **blockchain-based stablecoin pegged 1:1 to the Pakistani Rupee**, designed to power the next generation of **digital payments, cross-border remittances, and real-world asset tokenization** in Pakistan.

Deployed on the **Base** network — a fast, secure, and low-cost Layer-2 built on Ethereum — PKRSC enables **instant settlement**, **on-chain transparency**, and **compliance-grade control** through minting, burning, and whitelist/blacklist mechanisms.

This white paper outlines PKRSC's smart contract architecture, monetary model, governance framework, and its transformative potential for Pakistan's remittance and digital finance ecosystem.

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2. Token Model and 1:1 Backing

2.1 Design Principle

Each PKRSC token represents **one Pakistani Rupee held in reserve**. The system is fully collateralized:

Total PKRSC Supply ≤ PKR Reserves held in regulated custodial accounts.

2.2 Backing Mechanism

- **Reserve Accounts:** PKR reserves are held in Pakistani financial institutions or trusted custodians.
- **Minting:** PKRSC tokens are minted only when new PKR reserves are deposited.
- **Burning:** PKRSC tokens are destroyed upon redemption for PKR, maintaining the 1:1 parity.
- **Attestation:** Regular third-party audits or on-chain proofs confirm that circulating PKRSC equals PKR held in custody.

2.3 Value Proposition

- **Local Fiat Stability:** PKRSC maintains parity with PKR, enabling digital liquidity within Pakistan's monetary system.
- **Programmable PKR:** Enables instant, programmable transfers for payments, trade, and settlement without currency conversion risk.
- **Bridge for Remittances:** Serves as a digital proxy of PKR for cross-border inflows, remittances, and trade settlements.

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3. Smart Contract Architecture

The PKRSC contract implements an **enhanced ERC-20** standard with added administrative and compliance functions to support controlled issuance, redemption, and regulatory oversight.

3.1 Core Structure

Key storage variables (conceptually):

```
mapping(address => uint256) private balances;
mapping(address => mapping(address => uint256)) private allowances;
mapping(address => bool) private whitelist;
mapping(address => bool) private blacklist;
uint256 private totalSupply;
address private admin;
bool private paused;
```

3.2 Minting Function

Signature: `mint(address to, uint256 amount)`
Access: Admin or authorized minter

Purpose: Creates new PKRSC tokens corresponding to new PKR reserves.

Logic:

- Validates caller has minting rights
- Increases `totalSupply` and recipient's balance
- Emits `Mint(address indexed to, uint256 amount)`

Control: Minting is tightly restricted — only triggered when verified PKR reserves are deposited into custody.

3.3 Burning Function

Signature: `burn(uint256 amount)` or `burnFrom(address from, uint256 amount)`
Purpose: Destroys PKRSC tokens upon redemption of PKR from reserves.

Logic:

- Decreases `balance` and `totalSupply`
- Emits `Burn(address indexed from, uint256 amount)`

Impact: Maintains the peg by removing redeemed tokens from circulation.

3.4 Whitelisting and Blacklisting

Whitelisting

Only approved, KYC-verified addresses can participate in minting, redemption, or large transfers.
Functions:

```
addToWhitelist(address account);
removeFromWhitelist(address account);
```

Blacklisting

Enables compliance with AML regulations by restricting transactions from sanctioned or suspicious addresses.
Functions:

```
addToBlacklist(address account);
removeFromBlacklist(address account);
```

Effect on Transfers:

```
require(!blacklist[from] && !blacklist[to], "Blacklisted");
require(whitelist[from] && whitelist[to], "Not whitelisted");
```

These rules enforce a compliant token ecosystem aligned with financial regulation and anti-money-laundering obligations.

3.5 Pausing and Emergency Control

Functions:

```
pause();
unpause();
```

When paused, all transfers, minting, and burning are suspended — useful for emergency response, legal action, or contract upgrades.

Admin Controls:

- `transferOwnership(address newOwner)`
- `renounceOwnership()`

3.6 Security and Governance

- **Multi-Signature Admin:** Reduces centralization risk by requiring multiple approvals for sensitive actions.
- **Upgradeable Contract (optional):** Can be integrated via proxy architecture for future improvements.
- **Audits:** Full code verification and security audits before public circulation.

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4. Application in the Remittance Industry

4.1 The Problem

Remittances to Pakistan currently face:

- **High costs (2–8%)** due to intermediaries and FX spreads.
- **Delays** in settlement (hours to days).
- **Low transparency** in tracking cross-border funds.

4.2 The PKRSC Solution

PKRSC enables a **direct, near-instant, and traceable** transfer of value from any country to Pakistan via blockchain.

Remittance Flow:

1. **Sender Conversion:** Overseas worker converts foreign currency or stablecoin (e.g., USDC) into PKRSC via exchange or on-ramp.
2. **On-Chain Transfer:** PKRSC sent to recipient's wallet in seconds over Base.
3. **Redemption:** Recipient redeems PKRSC for PKR through regulated off-ramp partners (banks, wallets, or agents).

4.3 Advantages

Feature	Traditional Remittance	PKRSC
Settlement Time	1–3 days	Seconds
Cost	2–8%	<0.1% (gas fees)
Transparency	Low	On-chain ledger
FX Conversion	Required	PKR-denominated
Programmability	None	Smart contracts, automation

By removing intermediaries and enabling compliance on-chain, PKRSC can cut remittance costs, improve capital visibility, and foster financial inclusion.

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5. Governance, Compliance, and Risk

5.1 Regulatory Framework

PKRSC operates under full regulatory alignment with:

- **SBP (State Bank of Pakistan)** guidelines for digital financial services
- **FATF** KYC/AML standards
- **Cross-border transaction monitoring** via whitelisting and reporting

5.2 Reserve Transparency

- Regular publication of **attestation reports** verifying reserves equal circulating PKRSC.
- Potential integration with **proof-of-reserves** or real-time on-chain attestations.

5.3 Risk Management

Risk	Mitigation
Smart contract bugs	Independent audits and formal verification
Admin key compromise	Multisig governance
Regulatory changes	Adaptive compliance and sandbox testing
Reserve risk	Diversified custody and insured accounts

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6. Roadmap

Phase	Timeline	Milestone
Phase 1	Q4 2025	Smart contract audit, Base mainnet deployment
Phase 2	Q1 2026	Partnerships with custodial banks and off-ramps
Phase 3	Q2 2026	UAE → Pakistan remittance pilot
Phase 4	Q3 2026	Mobile wallet & merchant integrations
Phase 5	Q4 2026	PKRSC DAO launch and public reserve dashboard

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7. Conclusion

PKRSC is designed as the **digital backbone for a sovereign-aligned, compliant, and transparent remittance and payment ecosystem** in Pakistan.

By combining:

- **Blockchain transparency**
- **Regulated reserve backing**
- **Smart compliance controls**, and
- **Cross-border interoperability**

PKRSC represents a foundational layer for **Pakistan's digital rupee economy** — enabling instant payments, efficient remittances, and real-world asset tokenization under a secure, transparent, and compliant framework.

Summary

Attribute	Description
Name	PKR Stablecoin (PKRSC)
Peg	1 PKRSC = 1 PKR
Blockchain	Base (Ethereum L2)
Contract	0x220aC54E22056B834522cD1A6A3DfeCA63bC3C6e
Functions	Mint, Burn, Whitelist, Blacklist, Pause
Use Case	Domestic digital payments, cross-border remittances
Backed By	1:1 Pakistani Rupee in custody
Governance	Multisig admin → DAO transition
Audits	Pending (Q4 2025)