

The 7th Greenhouse Gas Inventory System Training Workshop



Digital Archiving and Long-Term Data Management for BTR Cycles

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Introduction to Digital Archiving in BTR Context

The ETF under the Paris Agreement emphasizes robust data management as an imperative for the success of BTRs. Digital archiving plays a critical role in ensuring compliance, accountability, and continuity in these vital reporting cycles.

Why Digital Archiving is Critical for BTRs:

- **Compliance:** Adherence to the detailed MPG stipulated under the ETF necessitates meticulous record-keeping and data retention. Digital archives provide verifiable proof of reported information.
- **Accountability:** Robust data management directly ensures the credibility of reports, and digital archives serve as the immutable record supporting this credibility.
- **Continuity:** BTRs are a crucial step towards greater accountability in global climate efforts. Effective digital archiving ensures that data for future reporting cycles is readily available, consistent, and well-documented. This is especially important as reporting evolves from previous mechanisms like Biennial Update Reports (BURs) and NCs.
- **Facilitative Technical Review:** The foundational principles of TACCC are paramount. Digital archiving, with its emphasis on data integrity and documentation, directly facilitates an effective and facilitative technical review process.

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Digital Archiving is Critical for BTRs:

Archiving Challenges



Data Integrity

Maintaining unaltered and trustworthy archived data.



Accessibility

Easily locating and accessing specific data points.



Regulatory Changes

Adapting to evolving UNFCCC guidelines and reporting.



Technical Obsolescence

Ensuring data remains readable as technologies change.

Archiving Opportunities



Automation

Streamlining archiving processes through data automation. This includes ingestion, indexing, and quality checks.



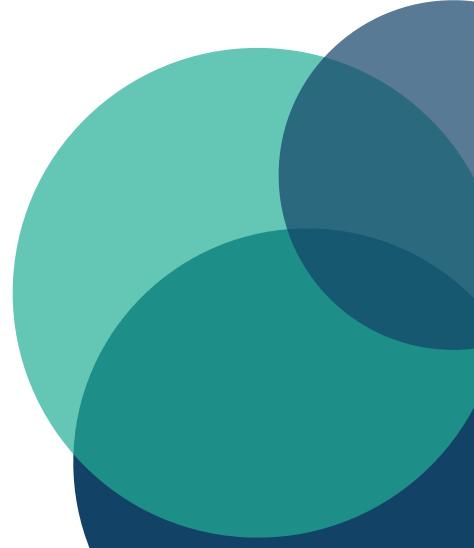
Interoperability

Designing systems for seamless data exchange. This should be compatible with national and international platforms.



Enhanced Analysis

A well-organized archive enables deeper analysis. This allows for identifying trends and impacts over time.



Best Practices for Long-Term Data Management

BTR Data Management Strategies

Implementation

Description



Structured Data Storage

Hierarchical storage, naming conventions, database integration.

Organized data for easy retrieval.



Metadata Tagging

Comprehensive metadata with standardized terms.

Descriptive information for data consistency.



Version Control

Systems to track changes with audit trails.

Track modifications and maintain accountability.



Best Practices for Long-Term Data Management

Effective long-term data management for BTRs requires a strategic approach to storage, metadata, security, and recovery.

Structured Data Storage:

- **Hierarchical Storage:** Organizing data in a logical, tiered structure (e.g., by reporting cycle, sector, data type).
- **Standardized Naming Conventions:** Implementing consistent file and folder naming to facilitate easy retrieval.
- **Database Integration:** Utilizing relational databases for structured data (e.g., GHG inventory data, NDC progress indicators) to ensure data integrity and query efficiency.

Metadata Tagging:

- **Comprehensive Metadata:** Attaching descriptive information to each data file, including source, collection date, methodology used, responsible entity, and any data transformations applied.
- **Controlled Vocabularies:** Using standardized terms for metadata to ensure consistency and comparability across datasets. This is crucial given that countries have encountered diverse experiences and challenges.

Version Control:

- **Track Changes:** Implementing systems to track all modifications made to data, allowing for rollbacks to previous versions if needed.
- **Audit Trails:** Maintaining detailed records of who accessed, modified, or approved data, enhancing accountability.

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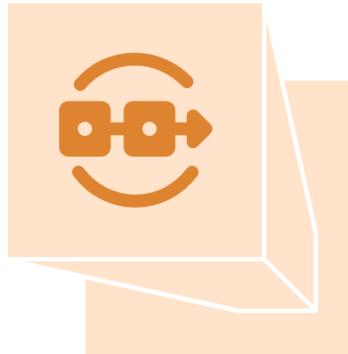
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Best Practices for Long-Term Data Management

Secure Storage Solutions Comparison

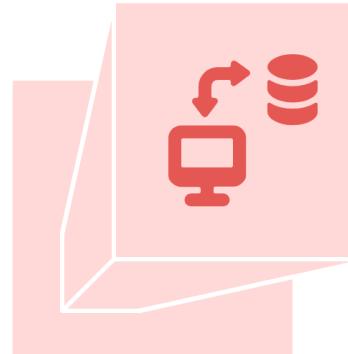
Hybrid Solutions

Combines control with moderate management complexity.



On-Premise Servers

Full control over data with high management complexity.



Cloud Storage

Scalability and accessibility with low control.



Decentralized Storage

Enhanced integrity but with high complexity and low control.



Best Practices for Long-Term Data Management

Disaster Recovery Protocols

Regular Backups

Automate scheduled backups of all critical data. This ensures data is consistently protected.



Recovery Plan

Develop and test a disaster recovery plan. This ensures business continuity in emergencies.



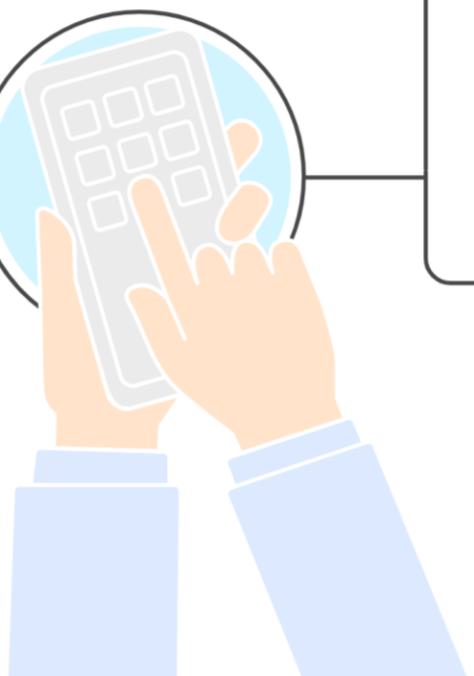
Off-site Storage

Store backup copies in a separate location. This protects against localized disasters and data loss.



Data Redundancy

Employ redundant storage systems. This minimizes the risk of data loss during disasters.



Regulatory and Technical Considerations



UNFCCC Guidelines

Compliance with data retention and transparency for BTR data. Archive should contain all data.



National Requirements

Integrate legislative and policy requirements for data archiving and privacy. Support national inventory systems.



Data Validation Tools

Implement automated checks to identify inconsistencies and validate data against benchmarks. Use QA/QC software.



Audit Trails

Record all actions performed on archived data, including access and deletion. Implement strong user authentication.



Stakeholder Permissions

Assign access levels based on user roles. Provide secure methods for authorized stakeholders to access data.

Case Study 1: Centralized National Archiving System for GHG Inventory

- *Country:* Thailand
- *Implementation:* Developed a web-based national GHG inventory database, automatically archiving all input data, calculations, and QA/QC reports. Integrated version control and user access logs.
- *Success Factors:* Strong political will, dedicated technical team, and capacity building for data providers.
- *Lesson Learned:* A centralized system significantly reduces data fragmentation and improves consistency across reporting cycles, addressing difficulties in data acquisition and populating specific reporting tables.



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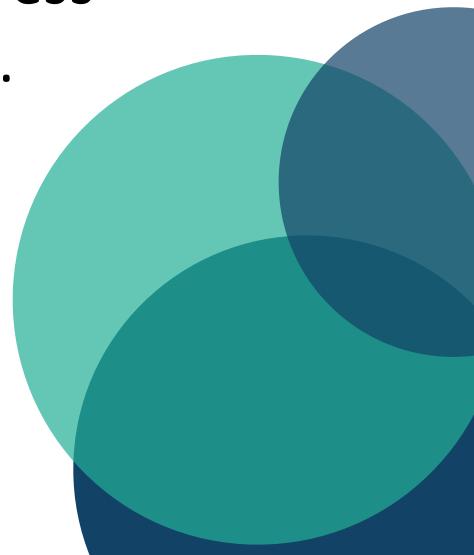


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Case Study 2: Leveraging Cloud for NDC Progress Data

- *Implementation:* Used a secure cloud-based platform to store and manage data for tracking Nationally Determined Contributions (NDCs), allowing real-time collaboration among ministries.
- *Success Factors:* High internet penetration, clear data sharing agreements, and initial investment in cloud security training.
- *Lesson Learned:* Cloud solutions offer flexibility and scalability, but robust data governance and cybersecurity measures are non-negotiable. Tracking progress towards NDCs presents its own set of data complexities for many countries.



Common Pitfalls and Mitigation Strategies

■ Insufficient Documentation:

Pitfall: Loss of institutional memory and difficulty in understanding historical data.

Mitigation: Mandate comprehensive metadata and documentation practices.

■ Lack of Regular Backups:

Pitfall: Catastrophic data loss from system failures or cyber-attacks.

Mitigation: Implement automated, scheduled, and off-site backup protocols.

■ Technical Obsolescence:

Pitfall: Inability to access or use old data formats.

Mitigation: Regular data migration to contemporary formats and use of open-source, widely supported file formats.

■ Weak Institutional Arrangements:

Pitfall: Disjointed data collection and archiving, leading to inconsistencies.

Mitigation: Strengthen institutional frameworks and data sharing agreements.



Future-Proofing Strategies

Modular System

Build archiving systems with modular components. This allows flexibility as guidelines change.

Open Standards

Prioritize open data formats and open-source software. This reduces vendor lock-in and facilitates interoperability.

Emerging Technologies

Explore how AI assists in automated tagging and validation. Investigate blockchain for immutable records.

Scalable Infrastructure

Design infrastructure that scales to accommodate increasing data volumes. Plan for increased storage and processing.

Continuous Learning

Foster a culture of continuous learning and adaptation. Stay informed about best practices in archiving.



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Please reach out to us for any question, comments or suggestions!



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