DCarbon Platform User Stories

Hybrid Utility Authorization (Green Button + UtilityAPI Integration)

Epic 1: Facility Registration & Utility Authorization

Story 1.1: Commercial Owner Registers New Facility with Green Button Utility

As a Commercial Owner
I want to register a new facility and authorize utility data access through Green Button
So that my energy data can be securely imported for REC management

Acceptance Criteria:

- Given I am a logged-in Commercial user
- When I click "Add New Facility"
- Then I should see options to select "Owner" or "Owner + Operator" role
- When I proceed to Finance & Installer Information modal
- Then I should see Green Button utilities (PG&E, SCE, SDG&E) displayed first as radio options
- And I should see "Not on the list?" with UtilityAPI dropdown below
- When I select a Green Button utility (e.g., PG&E)
- Then I should see an info block stating "You'll be redirected to your utility's secure Green Button portal"
- When I click "Continue to Green Button"
- Then I should be redirected to my utility's OAuth2 authorization page
- When I complete authorization successfully
- Then I should be returned to the platform with confirmation
- And my facility record should show auth_method="green_button", auth_status="authorized"

Technical Notes:

- POST to `/green-button/start` returns `{redirectUrl, sessionId}`
- Frontend polls `/green-button/status?sessionId=` for completion
- Backend updates facility record with auth_provider, auth_id, auth_status

Story 1.3: Owner Invites Operator to Complete Authorization

As a Commercial Owner (Owner role only)
I want to invite an Operator to complete utility authorization
So that the Operator can manage the authorization process independently

Acceptance Criteria:

- Given I selected "Owner" role during facility registration
- When I complete Finance & Installer Information without authorizing utilities
- Then I should be able to enter an Operator's email address
- When I send the invitation
- Then the Operator should receive an email with authorization link
- And I should see a "Utility Authorization Pending" banner on my dashboard
- And the banner should show "Resend Invite" options
- When I click "Resend Invite"
- Then I should be able to update the Operator's email address

Technical Notes:

- Facility record shows auth_status="pending"
- Email contains unique authorization link for Operator
- Owner can monitor status but cannot complete authorization themselves

Story 1.4: Operator Completes Authorization After Owner Invitation

As an Operator invited by an Owner
I want to complete utility authorization for a facility
So that energy data can be imported for the Owner's facility

Acceptance Criteria:

- Given I received an invitation email from an Owner
- When I click the authorization link
- Then I should land on the authorization interface
- And I should see the facility details and utility provider selection
- When I select a Green Button utility or UtilityAPI provider
- Then I should complete the authorization flow as described in Stories 1.1 or 1.2
- When authorization is successful
- Then the Owner should see the facility status change from "pending" to "authorized"

- And the "Utility Authorization Pending" banner should be removed from Owner's dashboard

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Story 1.5: Residential User Registers Facility

As a Residential user
I want to register my home facility and authorize utility access
So that my renewable energy data can be tracked

Acceptance Criteria:

- Given I am a logged-in Residential user
- When I click "Add New Facility"
- Then I should skip role selection and go directly to Finance & Installer Information modal
- And I should see the same utility authorization section as Commercial users
- When I complete authorization
- Then the same Green Button or UtilityAPI flows should work as described in Stories 1.1 and 1.2

Technical Notes:

- No Owner/Operator role distinction for Residential
- All authorization logic identical to Commercial Owner + Operator flow

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Story 1.6: User with In-Progress Registration Continues or Starts New

As a user with an incomplete facility registration
I want to either continue my existing registration or start a new one
So that I don't lose previous work but can still add multiple facilities

Acceptance Criteria:

- Given I have an in-progress facility registration
- When I click "Add New Facility"
- Then I should see a modal with options:
  - "Continue existing registration"
  - "Start a new facility"
- When I select "Continue existing registration"
- Then I should resume from where I left off
- When I select "Start a new facility"
- Then I should begin a fresh registration flow
- And my previous in-progress registration should remain saved

Epic 2: Data Ingestion & Synchronization

Story 2.1: System Automatically Ingests Meter Data After Authorization

As the System
I want to automatically retrieve meter data after successful authorization
So that meter information is available for interval data collection

Acceptance Criteria:

- Given a facility authorization is completed (Green Button or UtilityAPI)
- When the authorization status becomes "authorized"
- Then the system should call the UtilityAPI Meters Endpoint
- And retrieve service address, meterID, accountID, and meter blocks
- And store meter data in the meters table linked to the facility
- And update the facility's last_sync timestamp

Technical Notes:

- GET `/meters?authorization={auth_id}`
- Endpoint: `https://utilityapi.com/docs/api/meters`
- Also reference Meters Blocks for detailed meter information

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Story 2.2: System Performs Historical Data Collection

As the System
I want to collect the last three months of interval data after authorization
So that users have immediate historical context for their energy usage

Acceptance Criteria:

- Given meter data has been successfully retrieved
- When a new authorization is completed
- Then the system should initiate a historical collection request
- And retrieve interval data for the last 90 days
- And store interval data in the intervals table linked to meter_id
- And update last_sync timestamp after successful import

Technical Notes:

- Historical collection endpoint for last 3 months data

- GET `/intervals?meter_id={id}&start={90_days_ago}&end={today}`

Story 2.3: System Performs Scheduled Ongoing Data Synchronization

As the System
I want to regularly synchronize new interval data for authorized facilities
So that energy usage data remains current for WREGIS compliance

Acceptance Criteria:

- Given facilities have active authorizations
- When the scheduled sync job runs (daily/weekly)
- Then the system should retrieve new interval data since last_sync
- And update the intervals table with new records
- And update each facility's last_sync timestamp
- And log the sync event in audit logs

Technical Notes:

- Scheduled job checks all facilities where auth_status="authorized"
- Incremental sync: `start={last_sync}&end={now}`

Epic 3: Admin Dashboard & Management

Story 3.1: Admin Views Unified Authorization Dashboard

As an Admin
I want to view all utility authorizations in a single dashboard
So that I can monitor authorization status across all facilities and methods

Acceptance Criteria:

- Given I am logged in as an Admin
- When I navigate to the Utility Authorizations dashboard
- Then I should see a unified table showing all authorizations
- And the table should include columns:
    - User
    - Utility
    - Method (Green Button or UtilityAPI)
    - Status (Active, Pending, Failed)
    - Created date

- ○ Last Sync timestamp
- ○ Actions (View, Retry)
- ● And I should be able to filter by:
    - ○ Authorization method
    - ○ Status
    - ○ Utility provider
    - ○ Date range

Technical Notes:

- ● GET `/authorizations` returns combined list
- ● Includes both auth_method types
- ● Sortable and filterable columns

Story 3.2: Admin Retries Failed Authorization

As an Admin
I want to retry a failed authorization
So that I can resolve temporary connectivity or user issues

Acceptance Criteria:

- ● Given I see an authorization with status="failed"
- ● When I click the "Retry" action
- ● Then the system should reinitiate the authorization flow
- ● And send a notification to the relevant user (Owner or Operator)
- ● And update the authorization record with new attempt timestamp
- ● When the retry succeeds
- ● Then the status should change to "authorized"
- ● And last_sync should be populated

Story 3.3: Admin Views Facility Authorization Details

As an Admin
I want to view detailed information about a specific authorization
So that I can troubleshoot issues or audit compliance

Acceptance Criteria:

- ● Given I am viewing the Authorizations dashboard
- ● When I click "View" on any authorization

- Then I should see a detailed view showing:
    - Full facility information
    - Authorization method and provider
    - Authorization ID (auth_id)
    - Complete authorization timeline
    - All associated meters
    - Latest interval data summary
    - Audit log entries for this authorization
- And I should be able to download authorization details as CSV/PDF

Story 3.4: Admin Revokes Authorization

As an Admin
I want to revoke a facility's utility authorization
So that data access can be terminated when necessary

Acceptance Criteria:

- Given I am viewing authorization details
- When I click "Revoke Authorization"
- Then I should see a confirmation modal warning about data access loss
- When I confirm revocation
- Then the auth_status should change to "revoked"
- And the authorization should be terminated at UtilityAPI
- And an audit log entry "authorization_revoked" should be created
- And the user should be notified of the revocation

Epic 4: User Dashboard & Monitoring

Story 4.1: Owner Views Facility Authorization Status

As a Commercial Owner
I want to view the authorization status of my facilities
So that I know which facilities have active data collection

Acceptance Criteria:

- Given I am logged in as an Owner
- When I view my Facilities dashboard
- Then each facility should display:
    - Facility name and address

- ○ Utility provider
- ○ Authorization method (Green Button icon or UtilityAPI badge)
- ○ Authorization status (Authorized, Pending, Failed)
- ○ Last sync date/time
- When a facility is "Pending" (Operator not completed)
- Then I should see the "Utility Authorization Pending" banner
- And options to "Resend Invite" or "Change Email"

Story 4.2: Operator Views Assigned Facilities

As an Operator
I want to view facilities where I'm assigned as Operator
So that I can manage authorizations and monitor data collection

Acceptance Criteria:

- Given I am logged in as an Operator
- When I view my dashboard
- Then I should see all facilities where I'm the assigned Operator
- And I should see authorization status for each facility
- And I should be able to click on pending authorizations to complete them
- When a facility needs reauthorization (token expired)
- Then I should see a notification prompting me to reauthorize

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Story 4.3: User Views Meter and Interval Data

As a user (Owner, Operator, or Owner+Operator)
I want to view meter information and interval data for my facilities
So that I can monitor energy production and usage

Acceptance Criteria:

- Given I have an authorized facility
- When I navigate to the facility details page
- Then I should see all associated meters with:
  - ○ Meter ID
  - ○ Service address
  - ○ Account ID
  - ○ Meter type
- And I should be able to view interval data with:
  - ○ Date/time range selector

- ○ Usage/production values
  - ○ Data visualization (chart/graph)
  - ○ Export options (CSV, Excel)

Technical Notes:

- GET `/meters?facility_id={id}`
- GET `/intervals?meter_id={id}&start={date}&end={date}`

Epic 5: Security & Compliance

Story 5.1: System Rotates Access Tokens

As the System
I want to automatically rotate authorization tokens every 90 days
So that security is maintained per DOE DataGuard principles

Acceptance Criteria:

- Given an authorization token is 90 days old
- When the token rotation job runs
- Then the system should request a new token from the provider
- And update the auth_id with the new token
- And maintain data access without interruption
- And log the token rotation event
- When token rotation fails
- Then the system should notify the Admin and relevant users
- And attempt retry according to retry policy

Story 5.2: System Maintains Audit Logs

As the System
I want to log all authorization and data access events
So that compliance and security audits can be performed

Acceptance Criteria:

- Given any authorization or data event occurs
- When the event happens
- Then the system should create an audit log entry with:

- ○ Event type (authorization_created, authorization_revoked, interval_data_imported, authorization_method_changed)
  - ○ Timestamp
  - ○ User ID
  - ○ Facility ID
  - ○ Authorization ID
  - ○ IP address
  - ○ Event details
- And audit logs should be retained per compliance requirements
- And Admin should be able to search and filter audit logs

Story 5.3: System Ensures HTTPS and OAuth2 Security

As the System
I want to ensure all data transmission uses HTTPS and OAuth2
So that user credentials and energy data are protected

Acceptance Criteria:

- Given any communication with external services
- When data is transmitted
- Then all requests must use HTTPS protocol
- And OAuth2 authorization must be used for utility data access
- And no user credentials should be stored in the system
- And only authorization tokens should be retained
- And tokens should be encrypted at rest

Epic 6: Error Handling & Edge Cases

Story 6.1: User Handles Authorization Failure

As a user
I want to receive clear feedback when authorization fails
So that I can understand and resolve the issue

Acceptance Criteria:

- Given I am completing utility authorization
- When authorization fails (timeout, user cancellation, invalid credentials)
- Then I should see a clear error message explaining:
  - ○ What went wrong

- ○ What action I should take
- ○ Option to retry immediately
- And the facility should show auth_status="failed"
- And I should be able to retry authorization from my dashboard

Technical Notes:

- GET `/green-button/status?sessionId=` returns `{status, provider, errorMessage}`
- Frontend displays errorMessage to user

Story 6.2: System Handles Provider Downtime

As the System
I want to gracefully handle utility provider API downtime
So that temporary outages don't permanently affect authorizations

Acceptance Criteria:

- Given a utility provider API is unavailable
- When the system attempts to sync data
- Then the system should log the failure
- And implement exponential backoff retry logic
- And maintain the authorization as "authorized" status
- And notify Admin if downtime exceeds threshold (e.g., 24 hours)
- And display status indicator to users: "Temporarily unable to sync data"

Story 6.3: User Changes Utility Provider

As a user
I want to change the utility provider for a facility
So that I can correct mistakes or update when I switch providers

Acceptance Criteria:

- Given I have an existing facility with authorization
- When I navigate to facility settings
- Then I should see option to "Change Utility Provider"
- When I select a different provider
- Then I should see a warning that existing authorization will be revoked
- When I confirm the change

- Then the old authorization should be revoked
- And I should complete new authorization flow
- And audit log should record "authorization_method_changed"