**SUSTAINABLE ICE QUILT COST SHEET + FABRICATION GUIDE**

**Product:** Modular Reflective Ice Quilt Panel (10×10 meters, 100 m²)  
**Inventor & Author:** Matthew Cameron Kotapish  
**Goal:** Biosustainable fabrication for cryosphere preservation applications  
**Public Domain Dedication:** This work is released fully and permanently into the public domain under Creative Commons Zero (CC0 1.0 Universal). It may never be privatized, patented, or restricted.

**COMPONENT COST BREAKDOWN – BIOSUSTAINABLE MATERIALS**

| Component | Material Type | Unit Cost (m² or m) | Total Cost (100 m² Panel) | Notes |
| --- | --- | --- | --- | --- |
| Reflective Surface | White bio-polyethylene or bio-Mylar | $2.50–3.00/m² | $250–300 | High reflectivity, biodegradable or bio-sourced |
| Backing Layer | Recycled LDPE (GRS-certified) | $1.00/m² | $100 | Environmentally safe film substrate |
| Buoyancy Layer | Recycled or biodegradable foam | $2.00–2.50/m² | $200–250 | Closed-cell foam or plant-starch variant |
| Edge Connectors | Cotton rope or bioplastic clips | $0.30–0.50/m (40m) | $12–20 | 40m perimeter total |
| Drainage & Anchoring | Natural fiber ties / rope loops | $0.10/m² | $10 | No synthetic or metal components |
| Adhesive or Sealing Method | Water-based glue or heat seal | $0.25/m² | $25 | Low-emission assembly |
| Ethical Labor | Eco-partner, fair wage production | $2.00–3.00/m² | $200–300 | Community-based or off-grid small-shop |
| Packaging & Transport | Flat-pack or rolled bundles | $1.00/m² | $100 | Local/regional delivery to staging zones |
| Quality Testing + Handling | Field simulation & water/UV exposure | ~$0.50/m² | ~$50 | Basic QA step for durability |

**ESTIMATED PANEL TOTAL COST:**

* **Prototype Scale (1–10 units):** $800–1,100 per 100 m² panel
* **Bulk Scale (100+ units):** $500–750 per 100 m² panel

**OPTIONAL ADD-ONS:**

| Add-on | Cost Estimate | Description |
| --- | --- | --- |
| QR or GPS Eco-Tagging | $2–10 per unit | For inventory, tracking, or donor visibility |
| Organic Dye Labeling | $1–2 per unit | Biodegradable ink logos or tags |
| Compostable Anchor Stakes | $20 per 4-piece set | For temporary, reversible installation |
| Monitoring Sensor Module | $30–50 per panel | Optional environmental sensors (temp/UV) |

**COST PER KM² COVERAGE:**

* **1 km² = 10,000 panels (10x10m each)**
* **Bulk Cost (per km²):** $5M–7.5M
* **Impact:** Reflectivity restored over critical polar or glacial zones; passive temperature control system

**FABRICATION INSTRUCTIONS – HOW TO MAKE AN ICE QUILT PANEL**

**1. CUTTING THE MATERIALS**

* Cut two 10m x 10m sheets: one from reflective film (top), one from recycled LDPE (bottom).
* Cut 100 m² of buoyant material (foam or sealed bottles) to fit inside.

**2. ASSEMBLING THE QUILT**

* Lay bottom layer (LDPE) flat on a clean surface.
* Arrange the buoyancy material in a grid across the surface (in foam pads or bottle rows).
* Apply adhesive or heat-seal around each buoyancy section to secure.
* Place the reflective sheet over the top and align edges.
* Heat-seal or glue all edges shut, leaving a small flap for final sealing after inflation (if air is used).

**3. ATTACHING CONNECTORS AND ANCHORS**

* Sew, glue, or loop cotton rope through reinforced edge slits every 2 meters.
* Attach rope loops or clips at corners for linking panels together.
* Punch or slice drainage holes in low points, if needed.

**4. ROLLING AND PACKING**

* Once complete and dry, roll the panel with reflective side inward.
* Secure with twine or jute rope.
* Store in a dry, shaded place or waterproof sack for transport.

**5. DEPLOYMENT IN FIELD**

* Carry by sled, drone, or person.
* Unroll flat over target ice or water.
* Connect to adjacent panels using rope or clips.
* Anchor corners using compostable stakes or tied rocks.

**Summary:** This cost sheet and fabrication guide support the development and deployment of environmentally sustainable modular reflective quilt panels for the purpose of ice preservation. All pricing and processes reflect eco-friendly and ethical production values, including biodegradable materials, fair labor, and circularity.

This work by Matthew Cameron Kotapish is freely and permanently dedicated to the public domain. Anyone may use, improve, or deploy this system, but no person or entity may restrict access, claim ownership, or derive exclusivity from this concept.

Prepared for: Global public access and climate emergency response  
Author & Originator: Matthew Cameron Kotapish  
Date: [6/29/2025]