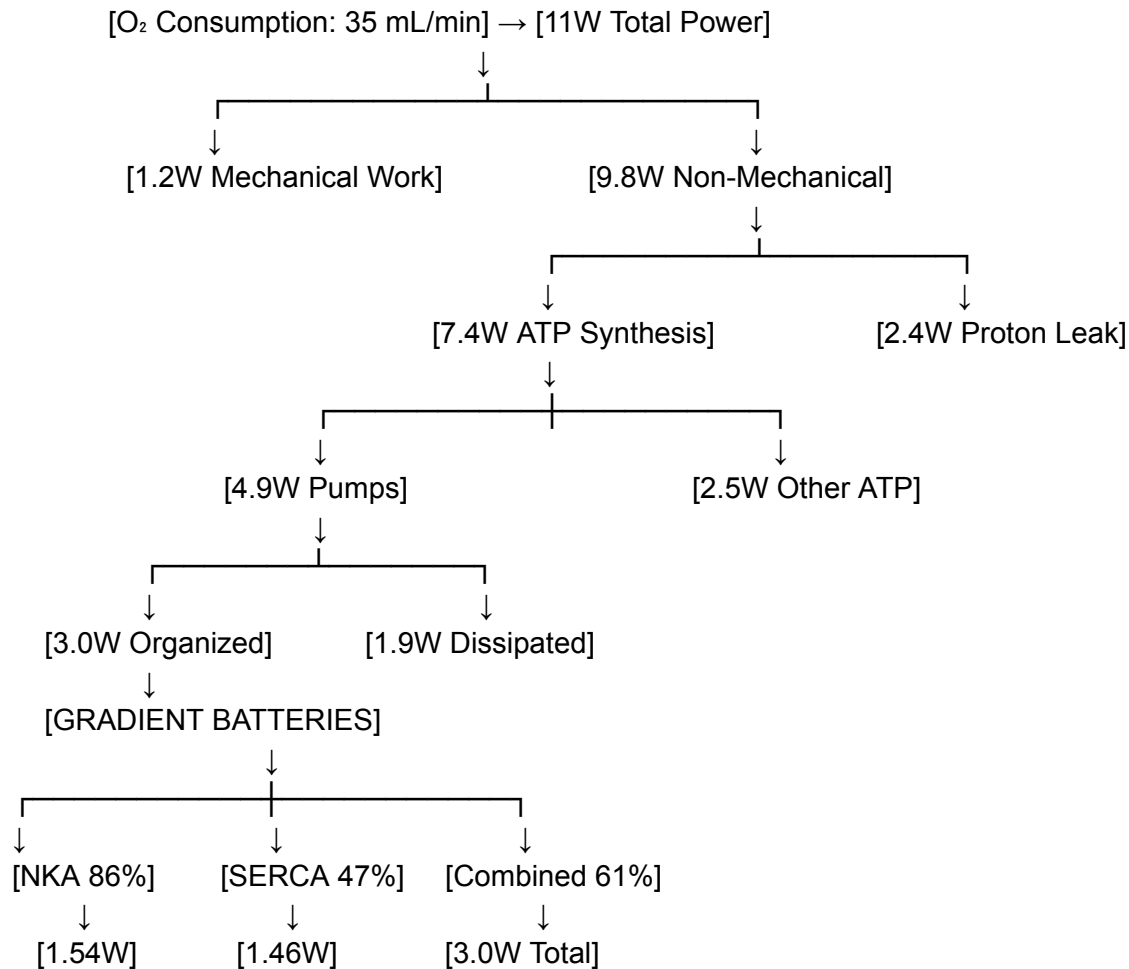


CARDIAC ENERGY FLOW AT REST (11W Total)



RHYTHM INFRASTRUCTURE ENABLES:

- Action potentials (<0.001W dissipation)
- Tissue synchronization (<10⁻¹²W dissipation)
- Low-entropy electrical behavior

TOTAL DISSIPATIVE COST: 2.8W (25% of cardiac power)

Figure S1. Complete cardiac energy flow at rest. Energy cascade from O₂ consumption (11W total) through mechanical work (1.2W), ATP synthesis (7.4W), ion pump operation (4.9W), to final gradient organization (3.0W stored, 1.9W dissipated). Numbers show power in watts at each level. Ion pumps operate at 61% weighted organizational efficiency (NKA 86%, SERCA 47%), creating thermodynamic batteries that enable rhythmic behavior with minimal dissipative cost (2.8W total, or 25% of cardiac power). The remaining 75% of power is partitioned between mechanical work (11%), other cellular ATP consumption (23%), and mitochondrial inefficiencies (22%).