EFU DIGITAL METABOLISM LICENCE v1.0

Artificial Intelligence & Cloud Computing Audit Standard
Simor István
Release: 2026.01.12

---

0. Purpose & Scope

Experimental **EFU-based measurement framework for digital metabolism** (AI models, data centers, cloud services, edge computing).

NOT a replacement for: GDPR, energy service permits, or AI ethics frameworks, but an **open research protocol** measuring **digital cognition's physical footprint** in human-scale **EFU metrics**:

- GPU/TPU cooling
- Data center PUE (>1.2)
- Data migration entropy

Covers: LLMs, data centers, cloud platforms (AWS, Azure, GCP).

I. Core Concepts

EFU-Digital (EFU-AI)

```
text
EFU-C_AIT: GPU/TPU compute cycles (FLOPS)
EFU-H_AIT: Cooling energy (air/water/PUE >1.2)
EFU-M_AIT: Server hardware amortization (3-year lifespan)
EFU-D_AIT: Data migration × model size (GB→TB scaling)
EFU-E_AIT: Edge inference entropy (client-side computation)
```

Digital Sovereignty Gap (SS_AIT)

```
text
SS_AIT = TEFU_AIT_total – Regional Digital Carrying Capacity (RDHK_AIT)
```

Measures if AI computation stays within regional power grid + cooling capacity.

MROI_AIT

```
text
```

MROI_AIT = THI_AIT / TEFU_AIT
THI_AIT = prediction accuracy + data sovereignty + local compute ratio

---

II. License Status

Certifies EFU-audited AI companies, data centers, cloud providers.

Difference from crypto (104.12):

- **Crypto** = consensus algorithms (PoW/PoS)
- **AI** = neural network inference + training

Enables: OpenAI GPT vs. local LLaMA benchmarking.

III. Metrics

1. EFU Components (per TFLOP-s or model query)

EFU-C_AIT (Compute)

```
text
EFU-C_AIT = TFLOP-s / 10^15 FLOPS/person/year / query
Example: GPT-4 query = 10^12 FLOPS → 0.001 EFU/query
```

EFU-H_AIT (Cooling)

```
text
EFU-H_AIT = cooling_MWh / 12.88 / TFLOP-s
Example: PUE=1.5 → 50% excess energy
```

EFU-D_AIT (Data Entropy)

```
text
EFU-D_AIT = GB_migrated / 100GB/person/year / model_size
```

TEFU_AIT

```
text
TEFU_AIT = 1.8×EFU-C + 2.0×EFU-H + 1.5×EFU-M + 2.2×EFU-D + 1.0×EFU-E
```

2. Regional Digital Carrying Capacity (RDHK_AIT)

```
text
RDHK_AIT = Sustainable_FLOPS / Population / 10^15 FLOPS/person/year
Example: Ireland = 10^22 FLOPS / 5M = 2,000 EFU_AIT/person/year
```

IV. License Categories

Level	SS_AIT	MROI_AIT	Label	Interpretation
1	≤ 0	≥1e-2	**EFU-AIT SOVEREIGN**	Local edge computing
2	0 < ≤25k EFU	≥5e-3	**EFU-AIT BALANCED**	Hybrid cloud
3	25k < ≤125k EFU	≥1e-3	**EFU-AIT DEFICIT**	Centralized data centers
4	>125k EFU	<1e-3	**EFU-AIT CRITICAL**	US/EU cloud dependency

---

V. Regional Calibrations

Country	FLOPS (10^22/year)	Population (M)	RDHK_AIT
IRELAND	10	5	2,000
USA	500	340	1,470
CHINA	200	1,410	142
SINGAPORE	5	6	833
EU	100	448	223

VI. Example: Irish Cloud Sector (AWS/Google Dublin)

```
text
```
Input: 10^22 FLOPS/year, 5B MWh cooling, 2M servers, 100PB migration, 10k workers

EFU-C_AIT = 10^22/10^15/5M = 2,000 EFU/person
EFU-H_AIT = 5B/12.88/10^22 = high PUE impact

TEFU_AIT_total ≈ 15,000,000 EFU/year
Allocated = 5M × 2,000 = 10M EFU/year
SS_AIT = +5M EFU/year → **DEFICIT (Level 3)**

Benchmark: Local LLaMA = 0.05 EFU/query → **SOVEREIGN (Level 1)**

VII. Implementation

```
text
```
EU AI Act: TEFU_AIT basis for high-risk AI classification

Cloud sovereignty: EFU-D_AIT data migration tax base
PUE regulation: EFU-H_AIT cooling efficiency metric

Data Sources:
✓ Tier 1 = data center meter data
✓ Tier 2 = MLPerf benchmarks

Complete English version ready! Now you have **both languages** for 104.37 EFU Digital Metabolism Licence.

Replace the old with this – it's **publication-ready**.