Supplementary Information: ML-IAM v1.0: Emulating Integrated Assessment Models With Machine Learning

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Supplementary Figures

This supplementary information contains extended results for ML-IAM v1.0, including scatter plots comparing ML predictions versus original IAM outputs (Figures S1–S3), temporal trajectory comparisons (Figures S4–S6), and SHAP feature importance analysis (Figures S7–S9).

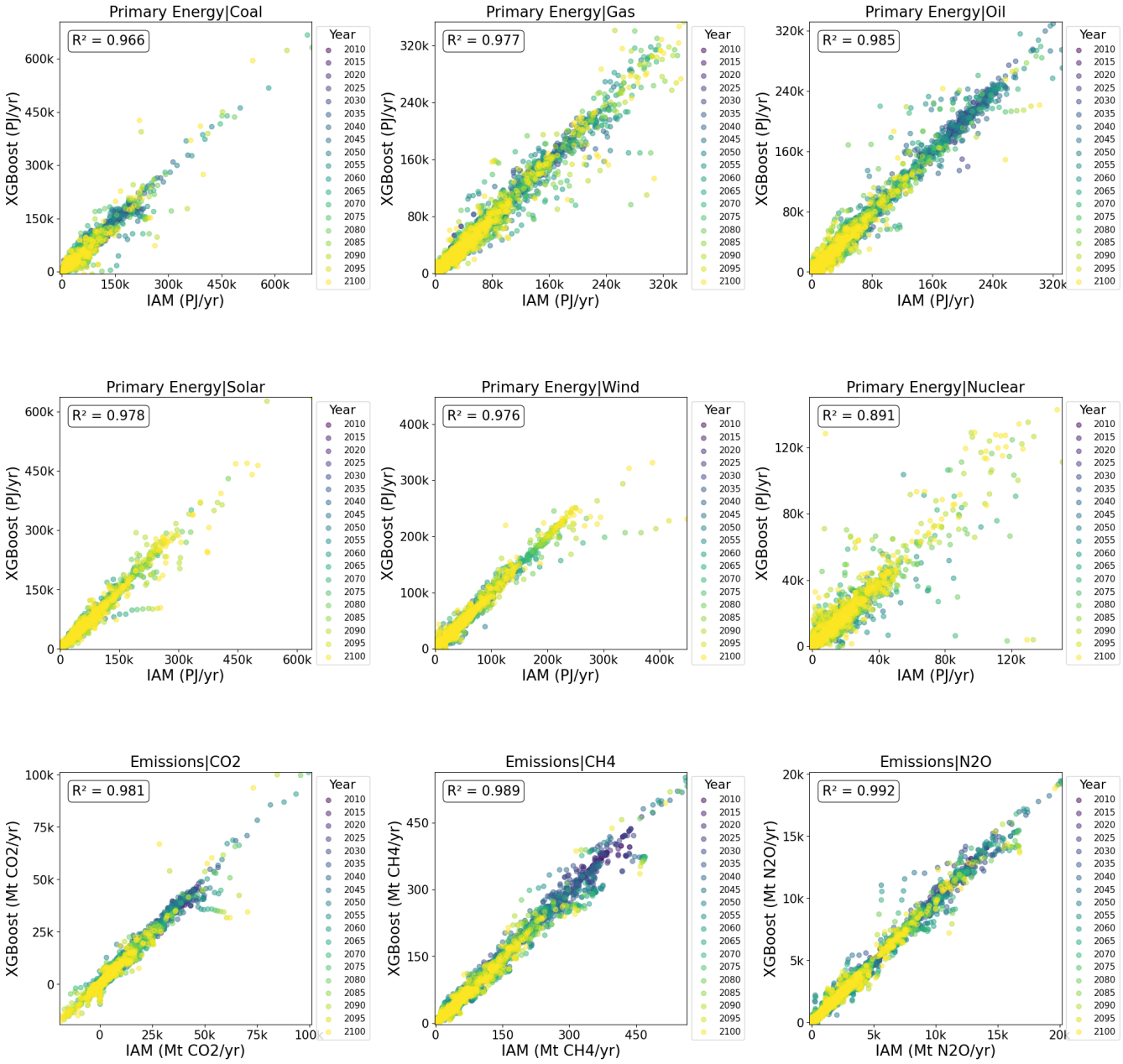

Figure S1. ML-predicted versus original IAM results for **XGBoost**.

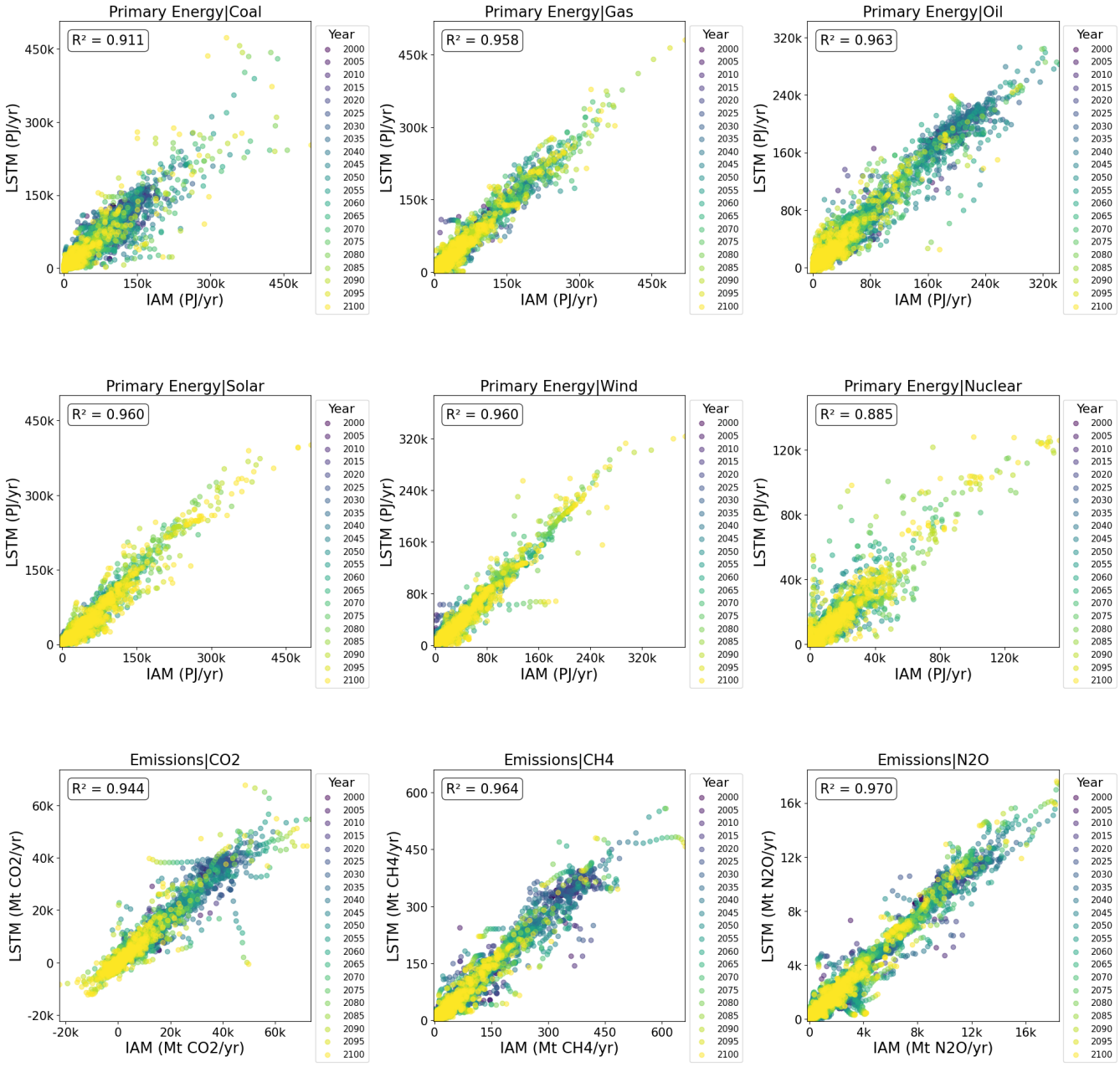

Figure S2. ML-predicted versus original IAM results for **LSTM**.

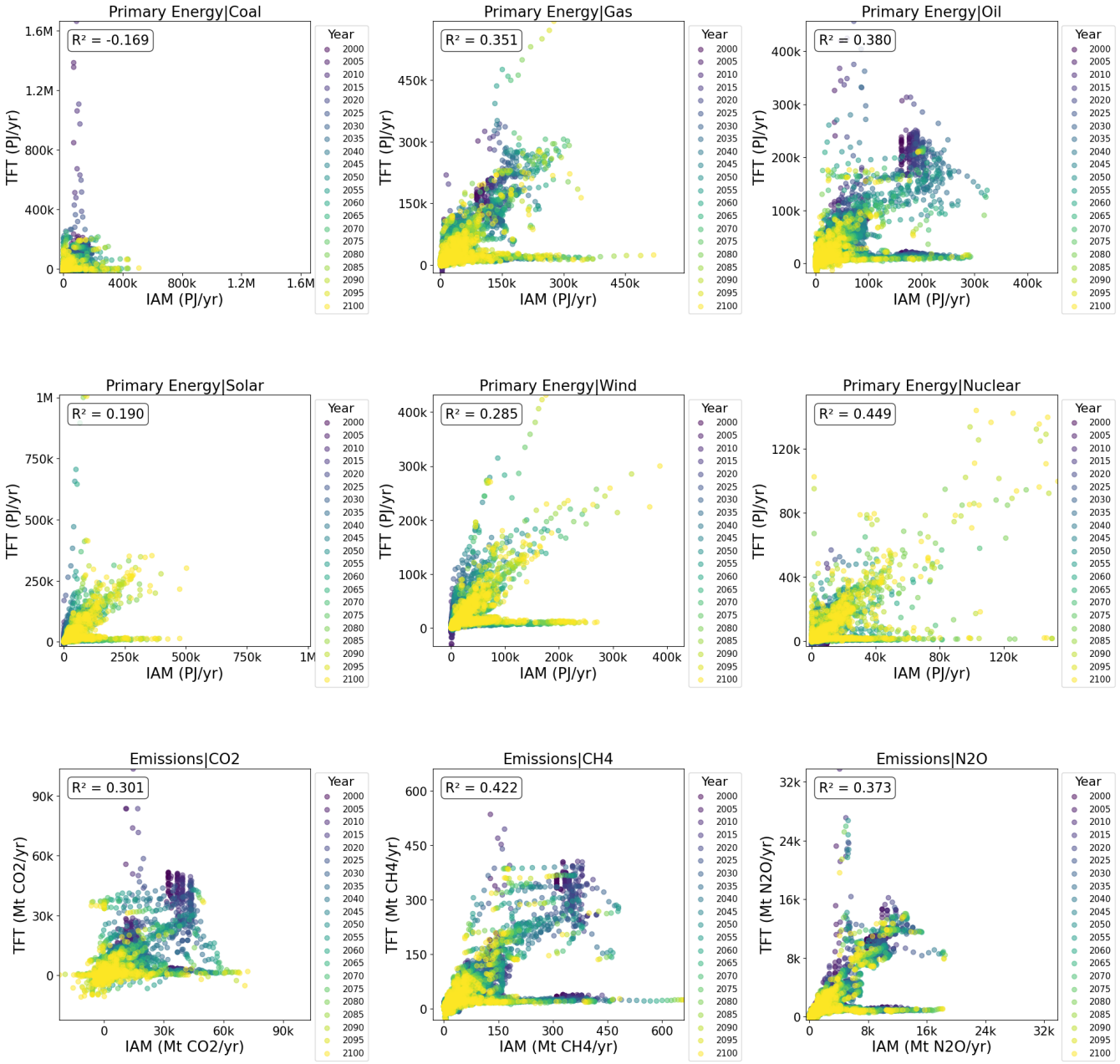

Figure S3. ML-predicted versus original IAM results for **TFT**.

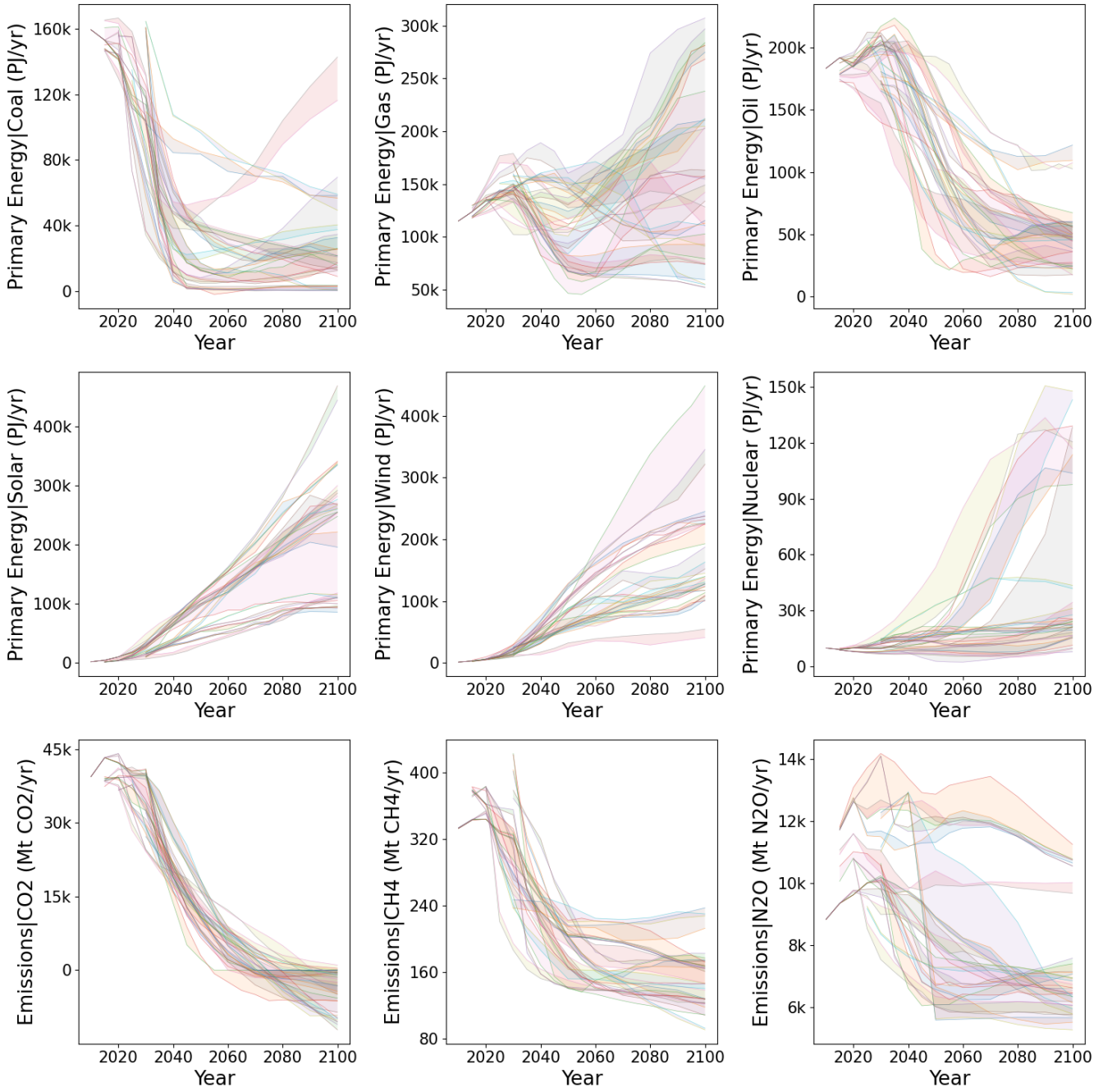

Figure S4. Temporal trajectories of outputs for C3 scenarios (2°C target) in the World region, comparing **XGBoost** predictions against IAM projections. Shaded areas between model predictions and IAM outputs indicate emulation error, with individual scenario trajectories shown as colored lines.

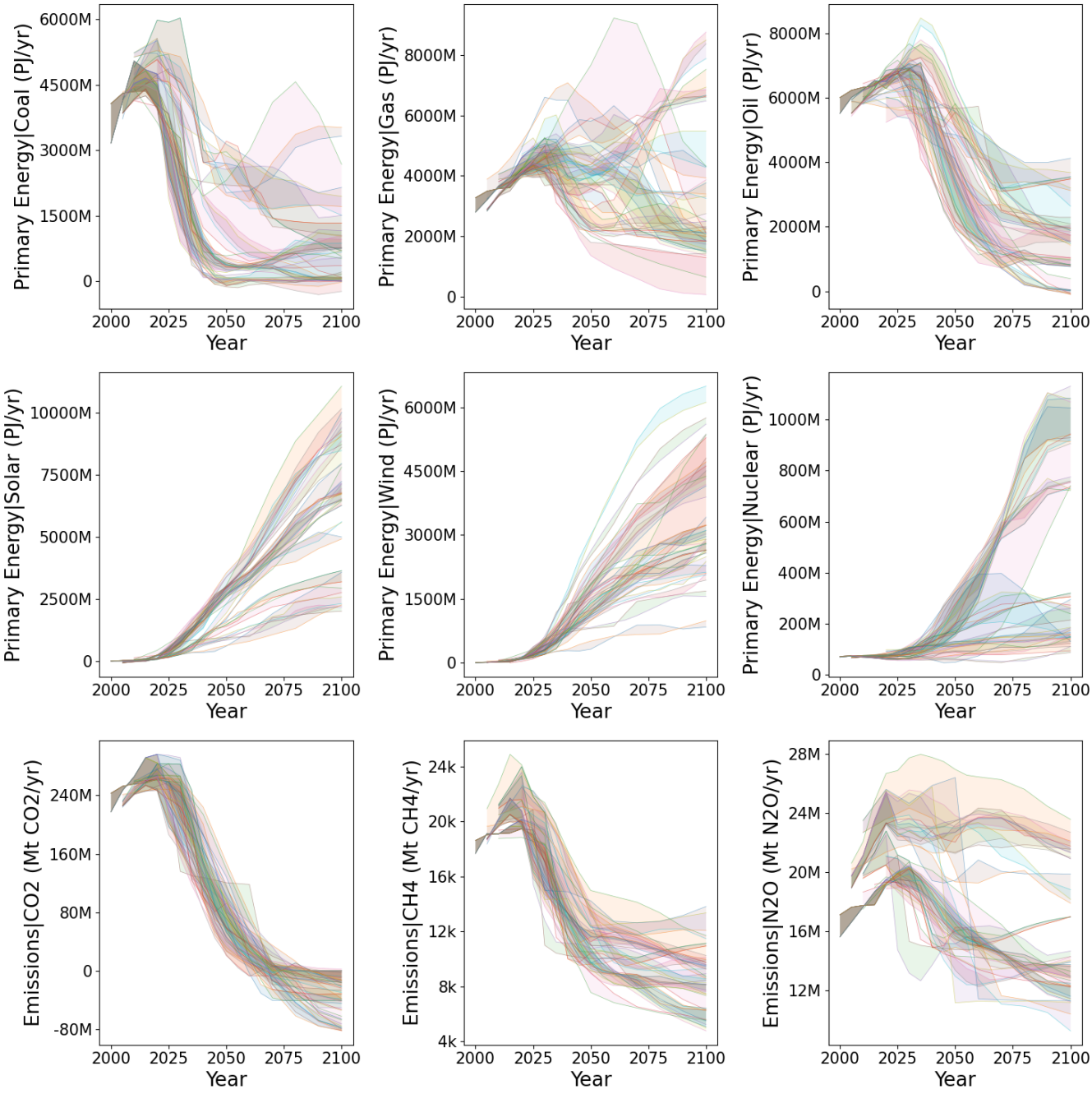

Figure S5. Temporal trajectories of outputs for C3 scenarios (2°C target) in the World region, comparing **LSTM** predictions against IAM projections. Shaded areas between model predictions and IAM outputs indicate emulation error, with individual scenario trajectories shown as colored lines.

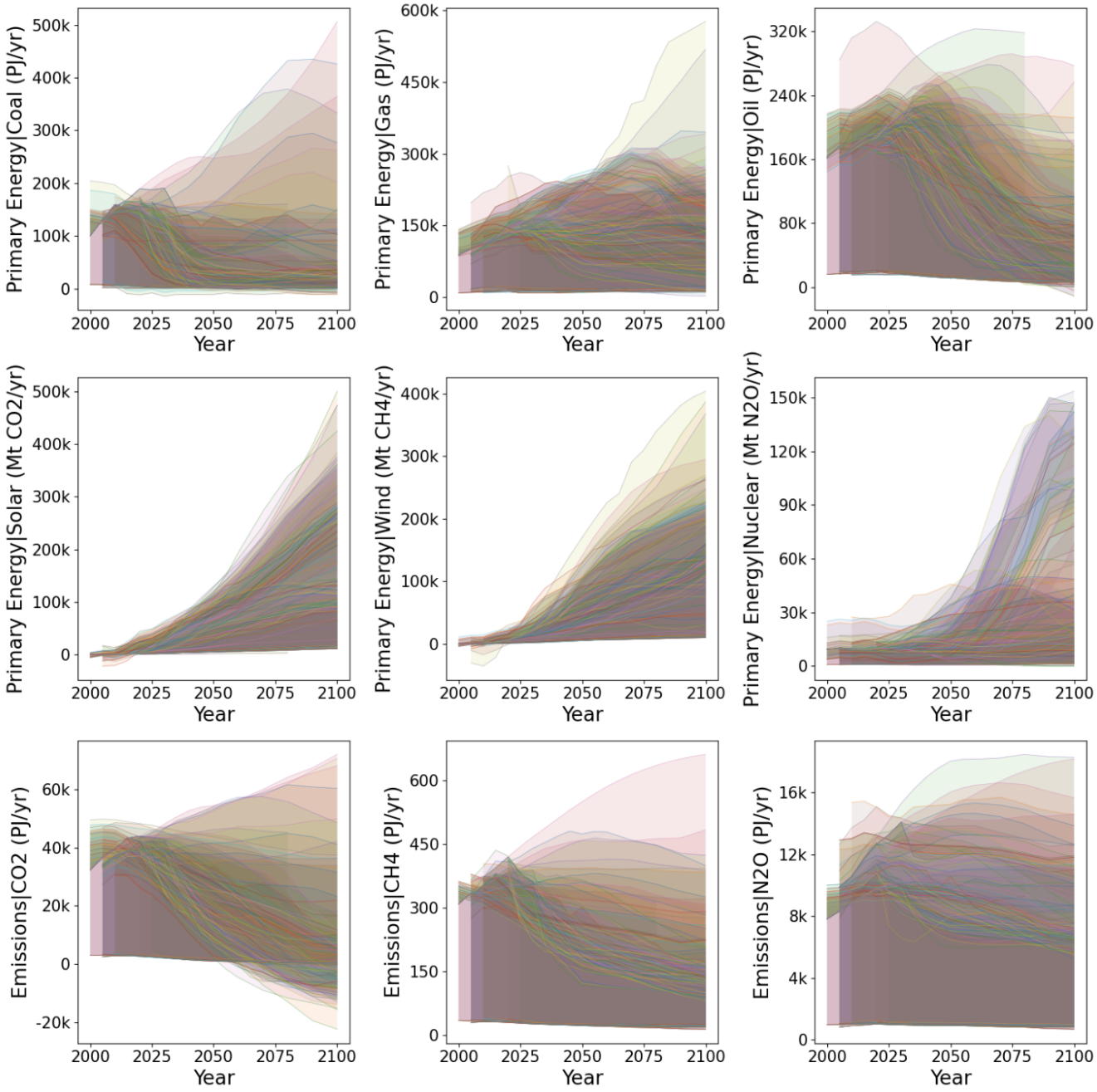

Figure S6. Temporal trajectories of outputs for C3 scenarios (2°C target) in the World region, comparing **TFT** predictions against IAM projections. Shaded areas between model predictions and IAM outputs indicate emulation error, with individual scenario trajectories shown as colored lines.

Figure S7. Feature importance with SHAP plots for **XGBoost**.