

T-Risk: Methodology In-Depth

The Entelligent® Difference: Smart Climate® Technology

Entelligent's Smart Climate platform is the world's first patented climate-scenario analysis tool that scores companies based on the resilience and sensitivity their share prices are likely to exhibit under a range of future climate paths. Our scores are forward-looking, updated every quarter, and available with over 15 years of historic data for performance back-testing purposes.

Entelligent's technology gives the company and its licensees the advantage of an exclusive methodology in security selection and index construction. These elements can in turn be included in financial products that will stand out in the marketplace. Our transparent data platform examines the impact of new laws and regulations, new technology, and energy transitions to calculate energy costs and profitability and their granular impact on each company. Companies that are likely to be durable – maintaining their return forecasts in most scenarios – are given superior scores.

T-Risk Methodology 5-Step Computation Guide and Key Features

T-Risk is a directional climate risk metric designed to improve financial and environment performance of equity investment portfolios.

- Direction and magnitude of T-Risk captures both climate alignments and speed of climate transition.
- A low T-Risk score indicates improved climate adjustments compared to peer companies. Conversely, a high T-Risk score indicates high exposure (and higher risk) in a transition to a low-carbon economy.
- A negative T-Risk score indicates superior adjustments in a low-carbon, Paris-Aligned scenario relative to business as usual.

Computation

1/ Model Inputs

Entelligent integrates simulated values from a number of Integrated Assessment Models (IAMs), including MESSAGEix, REMIND and GCAM. These IAMs take in Global Circulation Model (GCM) data, which provides state-of-the-art climate science forecasting. Through the IAMs, we capture the interaction of climate and economy, which enables us to predict energy mix and energy demand in future scenarios.

2/ Scenarios

For T-Risk, Entelligent uses two scenarios — Business as Usual (BAU) (in which the global economy keeps operating as it does now) and Paris-Aligned (in which the global economy reduces carbon on a path to meet Paris Accord objectives).

3/ Factor Selection / Energy Mix

Entelligent has developed a methodology to translate climate and energy information from the IAMs into global commodity (energy source) projections. The model simulates future price, supplier cost and demand for nine energy sources (oil, gas, coal, biofuels, renewable fuel, renewable electric, hydro, new tech and nuclear). To explain most of the variances for those 30+ energy factors, and reduce collinearity, we then identify the five most important energy factors. To do so, we use a combination of statistical analysis and subject matter expertise. The factors selected represent 95% of global energy flows.

4/ Downward Deployment

To make this information relevant to investors and risk managers, we use a standard procedure across industry groups and regions to map company-level stock performance to energy factors for BAU. T-Risk uses a Hierarchical Linear Model to link historical EIA data and IAM MESSAGEix forecasts differentiating BAU vs Paris-Aligned climate scenarios to estimate and forecast transition risk and opportunities to equities. This mapping is purely focused on historical price dependency of company share price (adjusted) and energy factors captured over 15 to 60 quarters. (It is not based on self-reported company level information.) Once mapping is established, we project future stock returns (two-year forecast) of each company for multiple climate scenarios (BAU, Paris).

5/ Score Generation

For T-Risk, we estimate deviation of return forecasts two years into the future to identify climate transition risk. The distance between two-year cumulative return forecasts under different scenarios is taken as a measure of transition risk. Securities with higher positive distance dispersion are more exposed to future policy, technology and energy shocks related to climate mitigation and adaptation. Securities with negative distance dispersion indicate superior adjustments in Paris scenario relative to BAU. (The output is akin to a Z-score.) To handle remaining outliers, we apply Gauss rank transformation.

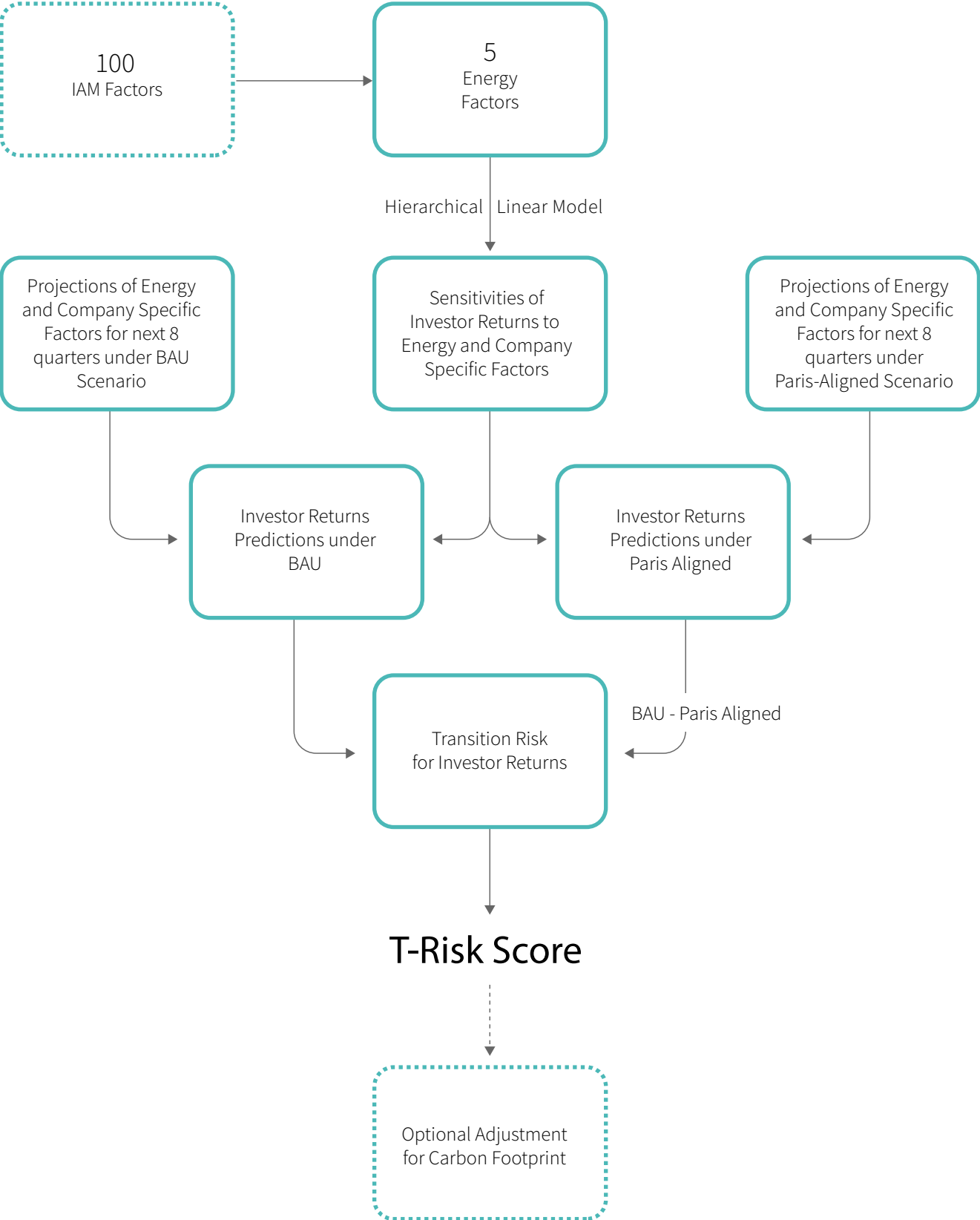
6/ Carbon Adjustment (Optional for T-Risk)

After estimating T-Risk at the security level, we adjust our estimates by adding entity-level carbon footprint information, which improves the transition gamma of resultant T-Risk based portfolios (also Gauss Rank-transformed).

Key Features

- Financial outperformance and carbon reductions are outcomes of T-Risk based portfolio construction for climate risk minimization. The companies and industry groups that show more resiliency toward climate and energy shocks tend to be more sustainable when compared to their peers in same industry group and region.
- The process of T-Risk computation is fully standardized. It is the same for BP, Walmart or Tesla.
- The T-Risk database is updated quarterly to capture the latest data, price movements and corporate actions.
- We have found the best results when scores are used on a portfolio basis. Systemic climate change risk is best concentrated and reduced relative to other systemic risks.
- By tilting an existing strategy toward securities with low climate transition risk exposures, we believe equity investors can create a portfolio with modest improved expected returns and greatly reduced carbon footprints. Compounded over time, the modest improvements can yield pronounced outperformance.

Transition Risk – Process



T-Risk Performance

E-Score and T-Risk (Carbon-adjusted) vs. Market



		CAGR	Sharpe	Max drawdown	Volatility (ann.)
E-Score (screened top 25% of index constituents)	●	12.89%	0.64	-31.82%	21.28%
T-Risk Carbon-adj. (screened top 25% of index constituents)	●	10.64%	0.54	-32.70%	22.90%
SPDR S&P 500 ETF Trust (SPY)	●	9.24%	0.51	-33.82%	20.80%

Total return five-year back test. Market cap-weighted. Sector inclusive.