31 IMPAIRMENT TEST

Cash-generating and start-up units

As required by the reference accounting standards (IAS 36), assets and goodwill have been subjected to impairment tests by determining the value in use, which is the current value of operating cash flows (duly discounted according to the DCF - discounted cash flow method) resulting from the 2017 - 2021 business plan approved by the Board of Directors of the parent company at its meeting of 10 January 2018.

The impairment test was applied to the following CGUs: electricity, integrated water management, environmental and other services (Public lighting and telecommunications) that are consistent with the business areas used for internal periodic reporting and with the information contained in the annual financial report in paragraph 2.02.07 "Information by operating segments".

In relation to this, it should be noted that the Group has implemented a structured process for preparing and reviewing the business plan, which involves formulating the Plan on an annual basis according to an external context scenario that takes into account the market trends and rules for regulated businesses, with the support of all the business units and following a "bottom-up" logic.

Specifically, assumptions were implemented in developing the 2017-2021 Business Plan consistent with those used in previous plans and, on the basis of the final reported values, forecasts were defined that had been internally processed through reference to the most authoritative and up external sources available wherever necessary.

Revenues for regulated business areas were developed on the basis of the evolution of the rates deriving from national regulations and/or agreements with the Area Authority. In particular, revenues from energy distribution were forecasted according to the principles of the AEEGSI 573/13 (RTDG), 367/14 (RTDG) and 199/11 (TIT) resolutions for gas and electricity respectively, and taking into account the respective WACC values approved, effective from 2016, through Resolution no. 583/15, and updated from 2019 in line with the methodology of the same resolution and according to the forecasts of the financial and fiscal parameters integrated into the approved Business Plan. Revenues from energy sales under protected conditions have been estimated on the basis of the regulatory reference texts of the Area Authority, i.e. the TIV (resolution 301/12) for electricity and TIVG (resolution 64/09) for gas. For integrated water management, the hypothesis used to forecast revenues assumed no change in the volumes distributed and was based on the rates originating from the agreements in effect with ATERSIR at the date the Plan and the application of the Water Rate method (MTI) set forth by AEEGSI resolution no. 664/15, also taking account the parameters underlying the hedging of financial and tax charges, among other factors. For urban sanitation, the hypothesis formalized involved achieving full rate coverage over all the areas served within the duration of the plan, consistent with the provisions of rules currently in effect.

Price trends for electric energy and gas bought and sold in the open market were worked out on the basis of business considerations consistent with the energy scenario under which the business plan was prepared, considering the forecasts provided by a panel of institutional observers.

The development of plants for the disposal and recycling of waste is consistent with the forecasts of the provincial plans in which the Hera Group operates. The investment schedule and the subsequent start of new plants is the result of the best estimate of the managers in charge.

The inertial evolution of the Group's costs in the plan timeframe was developed by formulating hypotheses based on the information available at the time the plan was prepared. Therefore, the most recent levels of inflation recorded in the final balance were taken into account, along with the anticipated trends outlined in the Economic and Financial Planning Document, as well as the forecasts made available by the Bank of Italy and European Commission. As far as personnel and the cost of the work is concerned, the indications contained in the various labour contracts have been taken into consideration.

The first year of the Plan represents the base reference for identifying economic, financial and management objectives that converge in the annual Budget, the guiding operational element for achieving the Group's growth objectives.

The cash flows generated were therefore determined using the forecasted data for the 2018 - 2021 period as a base. In particular, the Net Profit Margin was used, from which taxes were deducted, depreciation and provision were added and the maintenance investments planned for each year of the plan were deducted.

Following the last year of the plan, "normalized" Cash Flows were considered equal to the value of the Net Operating Profit for the last year of the plan, in the event that the value of depreciation and provisions remains at the level of the investments.

In the event that the plan does not take into account the prediction of future events that significantly influence estimated cash flows as a result of its medium-term timeframe, adjustments were applied in order to also incorporate the effects of such events. The cash flows are calculated by applying the growth rate ("g") to the "normalized Free Cash Flows" with the medium/long-term timeframe for the relevant sector (2% on average) for the 2022-2037 period (20 years total). For regulated services, these flows are brought into line with the expected continuation of market share following the completion of the expected calls for tenders.

These flows are supplemented by the current value of perpetuity, calculated as follows:

- for activities under market (gas and electricity sales), the cash flow resulting from the application of the perpetuity criterion for the last year (2037) was considered, assuming an average factor growth of 2%;
- for assets under contract, the terminal value was established by considering the cash flow resulting from the application of the perpetuity criterion weighted by the percentage of competitive bidding processes that the Group is expected to win at the end of the contract periods (100% for integrated water management, 80% for urban sanitation services) and the redemption value of assets weighted by the proportion of competitive bidding processes which the Group expected not to win; this value was estimated as equal to the current value of the net book value of assets owned and leasehold improvements, less the recovery values, in order to properly represent the non-renewal of the contract and the subsequent sale of the assets to the new operator with a value equal to the remaining book value.

For the discounting of unlevered cash flows, the weighted average cost of capital (WACC), representative of the return company lenders and shareholders expect for the use of their capital, was used as a rate, adjusted by the specific country risk in which the asset being valued is located. Specifically, for the purposes of the valuation, it was deemed necessary to use the so-called unconditional method, which to determine the WACC uses a risk-free rate that incorporates the country risk normalized by the monetary policies implemented by the Central Banks. The valuation of the specific country risk to be included in the discount rate is defined on the basis of information provided by external providers.
The discount rates used were therefore differentiated according to the specific characteristics and consequent risks characterizing business areas, as well as the countries, in which the Group operates. For Italy, a WACC of 5.59% was used for the environment and 4.84% for other businesses, while for the remaining European countries a WACC of 5.07% was used.

The results of the tests were positive. A sensitivity evaluation was also conducted. In this regard, it should be noted that the Group's business model, with its distinct resilience thanks in part to the diversified portfolio of assets under management, has made it possible to achieve constantly improving results over the years with no overall significant changes in the planned hypotheses despite the adverse macroeconomic environment.

In view of this, the sensitivity analysis that was developed focused on the marginality of the individual businesses, hypothesizing a 5% decrease that would result in a reduction in the cash flows developed in the years covered by the plan and subsequent years. In this context, the values obtained are much higher than those accounted for, therefore this analysis has further confirmed the carrying values.

Electricity generation assets
With reference to the market for electric generation, in the presence of impairment indicators and in keeping with previous financial periods, an in-depth analysis was performed to determine the recoverable amount of the Group's investments, and related financial assets, operating in the sector. In particular, the analysis was conducted by duly discounting to present value the cash flows expected to be generated over the remaining useful lives of the plants of Calenia Energia Spa, Set Spa and Tamarete Energia Srl for the purpose of verifying the recoverability of financial assets, equity investments and receivables recorded for them in the amounts of 24.3 million euro, 66.4 million euro and 21.9 million euro respectively at the end of the valuation process.

The negative trend in the electricity generation market highlighted a few years ago recently showed tangible signs of improvement, sustained by favourable conditions in the context, while the expectation of consolidating this recovery in the medium to long term remains valid. The causes behind the performance of the electricity market in past years stem from the combination of multiple factors on both demand and supply sides. The main factors shaping price dynamics are to be found in the:

- attainment of full operational capability of the plants built in the recent cycle of investment in new thermoelectric capacity (period until 2010/2011);
- introduction of significant production capacity in renewable energy in the past few years;
- low levels of energy demand caused by the negative economic cycle of the past few years, with the resulting impact on the reserve margin of the system which has reached a historical high.

The current economic condition is expected to change in the medium/long term, particularly due to:

- lack of financial sustainability, over this period, of the current spark spread levels for single-technology operators (CCGT) not integrated along the value chain (particularly in the absence of end customers) which, if the negative margins generated by their assets continued, will be faced with two alternative strategies: a) new capital injections to continue to operate in generation to benefit from higher margins in the long terms (not easy to implement, due to unfavourable financial market conditions and, in the case of foreign operators engaging in Italy, subject to the need for cross-border optimization of investment portfolios); b) exit from the generation market, with a resulting reduction of capacity on the supply side and price rise, an effect that has been observed in part also in the short-term;
- lack of productive investments in the expansionary phase, due to current overcapacity, which discourages the construction of new generation plants (currently there seem to be no new projects under way; rather, the less efficient plants are currently being phased out);
- lawmakers' interventions intended to reduce economic incentives for new renewable power, with an ensuing impact on investment growth in the sector;
- the progressive return of demand for electricity toward pre-crisis levels, with consequent reduction of the system's reserve margin.

That said, future cash flows determined on the basis of a medium/long-term energy scenario, formulated by an external expert - consistent with growth expectations for energy demand, installed power and the system's expected reserve margin, as outlined above - discounted to the weighted average cost of capital at 5.69% (calculated using the same methods illustrated for the units generating financial flows) will give rise to amounts for the investments and related financial assets greater than their carrying amounts for Calenia Energia Spa and Set Spa, while for Tamarete the outcome of the test entailed an adjustment of 5.5 million euro on the value of the receivable recorded among non-current financial assets, in consideration of the specific nature of the asset.

A sensitivity analysis was also carried out by reducing the curve of the spark spread by 2 euros/MWh compared to the medium-long term scenario suggested above. In this case as well, the adequacy of the amounts recorded for equity investments and related financial assets in Calenia Energia Spa and Set Spa was confirmed, while for Tamarete Energia Srl the impact would lead to additional adjustment of the value.