

24th September 2016
Blessed Virgin Mary of Mercy

**PONTIFICIUM CONSILIUM
DE IUSTITIA ET PACE**

To the kind attention of the President,

His Eminence, Most Rev. Cardinal Peter K. A. Turkson

*Palazzo S. Calisto
00120 Vatican City*

Dear Cardinal Turkson,

dear Chancellor of the Pontifical Academy of Sciences, Mons. Marcelo Sánchez Sorondo,

with my profound sentiments of honour and gratitude for your invitation to such an important Consultation entitled ***“Laudato Si’ and the path to COP 22”***, to be held on next Wednesday 28 September, guided by sincere spirit of service, I would like to share with you and with all the distinguished participants the following reflections.

*“Friendship is more useful to the world than the riches.”
Matteo Ricci SJ (1605)*

Actually this meeting demonstrates that the climate change challenge can turn into an important occasion of scientific and institutional N-S E-W cooperation, namely into a new opportunity of justice and peace.

Because Planet Earth has got just one border: that thin film of atmosphere where we all breath.

李白《静夜思》

床前明月光，
疑是地上霜。
举头望明月，
低头思故乡。

*“Beside my bed a pool of light
Is it hoarfrost on the ground?
I lift my eyes and see the moon,
I bend my head and think of home.”
Li Bai (750)*

Paris Agreement is really an historical milestone along the way for taking more care of Mother Earth, not only for the demanding but needful target consisting in the limit of global average temperature respect to the pre-industrial levels, but also for the fundamental principles and motivations, subscribed by 196 Countries, intimately related to the environmental concerns (intergenerational equity, climate justice, common but differentiated responsibilities and respective capabilities, rights of indigenous people and migrants, need of eradication of poverty, safeguarding food security, importance of public awareness and participation), (LS, 13) ***“bringing the whole human family together to seek a sustainable and integral development, for we know that things can change.”***

*“Lord, make me an instrument of thy peace”
Saint Francis of Assisi (1220)*

In the encyclical *Laudato Si’ (LS)* Pope Francis has launched *to all people* an heartfelt appeal about our common home, firstly as regards the global problem of climate change, by analysing its *grave implications: environmental, social, economic, political and for the distribution of goods* (LS 25), and by exploring its deepest roots from an anthropological, ethical and spiritual points of view, reaching up to the need of a *conversion* to an *integral ecology* and ultimately to an urgent request for a *new, universal solidarity*.

Being aware that *“the same mindset which stands in the way of making radical decisions to reverse the trend of global warming also stands in the way of achieving the goal of eliminating poverty. A more responsible overall approach is needed to deal with both problems: the reduction of pollution and the development of poorer countries and regions.”* (LS, 175)

*“The idea that economic growth and climate action are incompatible may sound hardheaded and realistic, but it’s actually a fuzzy-minded misconception.
If we ever get past the special interests and ideology that have blocked action to save the planet, we’ll find that it’s cheaper and easier than almost anyone imagines.”
Paul Krugman, Nobel Prize (2014)*

I’m personally convinced that such complex ethical and environmental goals are not only necessary and wise but also perfectly feasible.

*“If you don’t know to which harbour you’re sailing, no wind is favourable.”
Seneca (50)*

The question is: what is the best way to achieve them in the shortest possible time?
Probably the most effective method to find out an answer consists in an effort of hope and imagination, averting every possible nightmare. A leap into the future, from which it is possible to glimpse the key trends, to identify the factors that can work, to raise innovative ideas (as known, the ancient Greek root of the word “idea” is “sight, vision”), to learn some useful indication.

“An integral ecology is marked by a broader vision.” (LS, 159)

A foresight scenario, through a sort of evocative/provocative “backward planning”, an introductory exercise of “logical framework approach” ¹
So, let’s try to broaden and lengthen our gaze!

*“We need well-trained lay people animated by a sincere and limpid faith.
We need lay people with vision of the future.”
Pope Francis (2016)*

¹ Logical Framework Approach (LFA) is a management methodology developed in 1969 for the U.S. Agency for International Development (USAID). It is largely implemented by multilateral donor organizations for country assistance programs.

Vatican City, 28th September 2030

The Dicastery for Promoting Integral Human Development and the Pontifical Academy of Sciences have jointly organized the Conference **“Heavens declare and the path to COP 36”**.

A year after the publication of the Encyclical Letter **“Heavens declare”** of Pope Francis II on integral ecology, there is the need to analyse the recent progresses obtained in the fight against global warming.

The assembly has expressed moderate optimism.

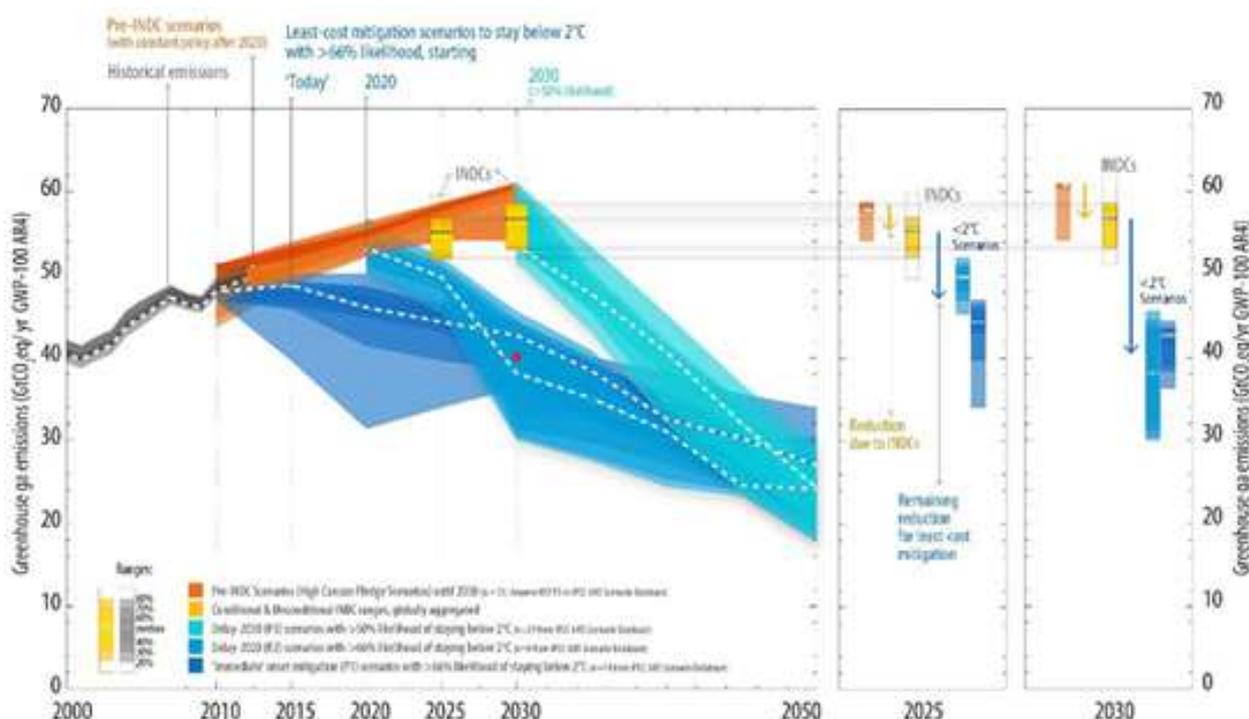
In fact, after the stocktaking events held in 2023 and 2028 to assess the collective progress towards the goals of the Paris Agreement, even if the increase of global average temperature is still alarmingly approaching the limit of 1.5°C above pre-industrial levels along with all related deleterious effects (extreme wheatear events, arctic sea ice and glacial retreat, ocean acidification, desertification, biodiversity loss, diseases, etc.), fortunately the latest figures and credible projections (Mauna Loa Observatory has registered a slight deceleration of the atmospheric concentration of CO₂, namely 425 ppm), confirm that global GHGs levels started a route of sharp slowdown, approximately along the curve wished by IPCC fifteen years ago.

In these last years, according to the principle of **“common but differentiated responsibilities and respective capabilities (CBDR-RC)”**, the bar of NDCs have been considerably raised, practically doubled, while effective compliance mechanisms have been implemented.

To some extent, international community is trying to build on the overall positive experience concerning the fight against ozone depletion, in terms of combination of global regulatory norms (LS, 173) and methods to reduce/avoid CFCs-GHG.

The paradoxical match Humanity vs Anthropocene continues.

“Hope is a path on the mountainside. At first there is no path. But then there are people passing that way. And there is a path.”
Lu Xun, leading figure of modern Chinese literature (1930)



Here below, a synthesis of the most significant evidences emerged from the comparison of experience, scientific outcomes and views among the participants.

Electricity from solar and wind exceeds 30% at global level.

In particular, around year 2020 photovoltaic has reached the “grid parity” in most countries.

Increasing distributed generation and prosumers’ proliferation², also thanks to the new storage battery systems, has revolutionized shape and activities of utilities, now committed mainly in demand side and smart grids management, closely integrated with information and communication technologies.

Solar is recognized as the most democratic source of energy.

The target of 100% electricity from renewables by the end of the century is considered practicable, also because it has been already attained in some country (e.g. Denmark).

A combination of industrial, economic (e.g. high costs of oil extraction, oversupply), environmental (norms more and more cogent on externalities, limits of GHGs emissions and pollutants according to the Clean Air Scenario³) and fiscal (carbon tax) elements, together with a relevant drop in consumption (energy efficiency, also thanks to the innovation extensively introduced in the building sector – net-zero energy building is a standard – especially concerning new materials, integration with renewables and automation), has made fossil fuel not convenient in many circumstances. That has already led to clamorous collapses of some big company.

Coal and oil – after their peak in 2020 – are the hardest hit sectors.

Natural gas maintains an important role in the global energy balance.

But it is clear that brown economy has been outclassed by the green one.

Apart any concern on the related environmental risks, if not supported by public subsidies, nuclear (especially if the entire project cycle of plants is assessed) is not cost-effective.

After the dramatic burst of the shale oil/gas bubble, fracking has been abandoned, also for its heavy impact on the subsoil and aquifers.

Same fate for many techniques of CO₂ sequestration.

Rockefeller Brothers Fund director Stephen Heintz said the move to divest from fossil fuels would be in line with oil tycoon John D Rockefeller's wishes: “We are convinced that if he were alive today, as an astute businessman looking out to the future, he would be moving out of fossil fuels and investing in clean, renewable energy.” (2014)

Conservation and enhancement of natural sinks and reservoirs found satisfying results concerning forests. In fact, thanks to the initial international agreement adopted in Warsaw (back in the year 2013, COP 19), then strengthened through the UN Programme on “Reducing Emissions from Deforestation and Forest Degradation in Developing Countries” (REDD) and the further legal and binding decisions on protection and monitoring of forestry and agroforestry, since 2020 net contribution of forests to the mitigation of climate (new green areas/surface deforested) is positive and constantly growing.

Moreover, original techniques of CO₂ capture in soils and biogas production are well advancing.

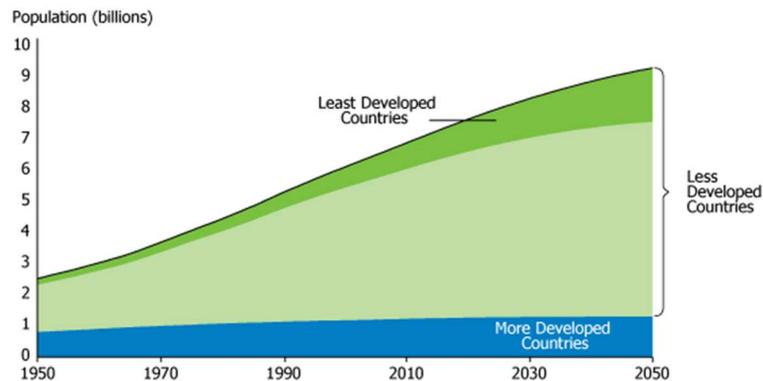
*“Economy is a humanistic science”
Amartya Sen, Nobel Prize (2000)*

² “prosumer” is a person who produce autonomously and consume energy.

³ International Clean AIR (Avoid, Innovate, Reduce) Programme.

Over 8 billion people dwell in the planet.

By the end of the century world population should touch 10 bn, with an overwhelming majority in less developed countries, now grouped in strong associations.



Fortunately, cheap costs (still dropping) of new energy technologies (electric, thermal, lighting), along with vast mitigation&adaptation programs, has allowed to achieve almost completely the praiseworthy initiative “Sustainable Energy for All”, and the energy targets of the UN 2030 Agenda for Sustainable Development, responding to almost the whole basic needs of the most vulnerable communities, especially in Africa.

In several cases, the improvement of living conditions has been accompanied by actions of technology transfer, capacity building, assistance and promotion of entrepreneurship, involving also many women. In addition, these good examples of local development, have influenced some slight decrease of the Gini index (more equal income distribution in a country) and the migration flows, often caused by deteriorated environmental conditions.

*“For I was hungry and you gave me food, I was thirsty and you gave me drink”
(Jesus Christ)*

Electric means of transport (cars, motorcycles, trucks, even ships), new forms of shared mobility (including bikes) and biofuels (used also for airplanes), hydrogen powered vehicles, have conquered important market shares, principally in the growing (in number and dimension) cities around the world, especially in China.

Last year, 50% new auto sales in US, China and EU were electric.

*“Respect yourself and others will respect you.”
Confucius (490 b.C.)*

Smart manufacturing (Industry 4.0), integrated with modern information-intensive infrastructures, with diminished use of raw materials and circular economy are consolidated realities.

Sometimes they have sorely supplanted ancient habits and cycles of production.

Now they represent important economic sections.

Some breakthrough invention – for instance, large scale artificial photosynthesis, nanotechnology, phase change materials applied to PV, advanced Led, driverless cars – are accelerating the transition.

In general, new supply chains are creating a significant volume of jobs.

“The time has come to accept decreased growth in some parts of the world, in order to provide resources for other places to experience healthy growth.” (LS, 193)

Macroeconomic data show that carbon intensity (GHGs/GDP unit) is definitely decreased.
CO₂ emissions and economic growth are clearly decoupled.
The old idea of infinite or unlimited growth has been overtaken by reality.

*"The benefits of taking action to address climate change have become ever more compelling.
Many countries and businesses have recognized the opportunities
related to decreasing greenhouse gas emissions and strengthening resilience."
Ban Ki Moon (2015)*

GDP has been revised as main measurement of wealth, by introducing significant environmental and social parameters.

Coexistence of economic resizing with a general improvement of quality of life, is largely accepted by populations in more economically developed countries.

*"You ask for what reason I stay on the green mountain,
I smile, but do not answer, my heart is at leisure.
Peach blossom is carried far off by flowing water,
Apart, I have heaven and earth in the human world."
Li Bai (750)*

People's Republic of China is undoubtedly the leader in the world struggle against climate change.

China has been able to transform intelligently this epochal dare into a great opportunity.

In the just released Sixteenth Plan (2031-2035), China not only makes an assessment of the results already accomplished (e.g. 1.000 GW wind, 250 GW PV capacity installed so far, peak emission got in 2022, sooner than expected, lowest carbon intensity, improvement of ecological living, especially concerning air quality in cities, also thanks to the programme "Urbanization with Chinese characteristics" 国家新型城镇化, welfare conditions and ecological culture).

A big initiative "Made in China 2050" (中国制造2050) is also included.

Moreover, the fine-tuning of an international Emission Trading Scheme has enabled the creation of a real carbon market, accelerating the process by leveraging enormous financial resources.

*"All people and countries face common challenges, and through their actions will arrive at a common fate."
Xi Jinping (2016)*

The European Union – confirming its pioneering role since the Kyoto Protocol in the distant year 1997 - has brilliantly and in advance achieved the targets within its Energy Strategy for 2030 (30% share of renewable energy consumption, 33% energy savings compared with the business as usual scenario, a 42% cut in greenhouse gas emissions compared to 1990 levels).

Security of supply is improving: the dependency on energy imports respect to gross inland energy consumption, particularly of oil and gas, has decreased from 53,5% in 2014, to less than 35% in 2029.

Moreover, EU has set new determined goals for 2050 and beyond, driving in this effort of innovation entire economic sectors. And almost 50% of European R&D activities is related, directly or indirectly, to climate issues.

*"Europe will not be made all at once, or according to a single plan.
It will be built through concrete achievements which first create a de facto solidarity."
R. Schuman (1950)*

*“What kind of world do we want to leave to those who come after us,
to children who are now growing up?” (LS, 160)*

From a financial point of view, we assist to a huge increase of new investments in renewables and energy efficiency (also crowdfunding, advanced TPF⁴ schemes), while fossil fuels sectors are suffering a divestment phenomenon, with grave geopolitical implications.

In 2025 has been decided that developed countries must reach the collective goal to mobilise USD 200 billion per year by 2040 and extend this until 2050.

A new and higher goal will be set for after this period, in order to pursue more inclusive policies, including a loss and damage system.

Furthermore, new international fiscal measures have been implemented.

*“Opus iustitiae pax”
Isaiah (700 b.C.)*

Around the Catholic Church, a vast religious and cultural grassroots movement is now committed at various levels in supporting energy and ecological transition, on the basis on ethical motivations unanimously agreed. Ecumenical initiatives of prayer for the care of creation are multiplying.

The need of care for the common home is not only taught in schools and families but also included in catechism in all 3.000 dioceses, especially in terms of appeal and instructions for a more sober lifestyle and ecology of daily life.

*“Technologically advanced societies must be prepared to encourage more sober lifestyles,
while reducing their energy consumption and improving its efficiency.”
Benedict XVI (2010)*

Frequent exhortations from the Pontiff, an ongoing decarbonisation program of Vatican City, edifying practices in many missions, a more active participation to the international dynamics and negotiations and an assiduous work of “climate diplomacy” have contributed to get significant results.

After Marrakech 2016, a new “Subsidiary Body for Environmental Ethics” (SBEE) is officially involved in the Conference of Parties, with an incisive participation of the Catholic Church.

*A global consensus is essential for confronting the deeper problems,
which cannot be resolved by unilateral actions on the part of individual countries. (LS, 164)*

It is recognised that environmental problems affect us all closely. People is evermore interested.

Climate is now considered a major political question. Type and effectiveness of the solution proposed are conditioning many election results.

New and broader occasions of public debate and international dialogue⁵ are occurring all over the world.

*“At the end of our life, we will not be asked if we are believers, but credible.”
Rosario Livatino (1990)*

⁴ third party financing

⁵ words like “debate”, “dialogue” and “discussion” are repeated more than 50 times within the text of *Laudato Si'*

Utopian? I do not think so.

Ambitious but realistic? Yes.

The ultimate result will depend upon a complex of human will and unknown factors.

But one thing is certain: a global problem requires a global response, starting (today, now) from our own personal decision *to take charge of this home which has been entrusted to us.*

Indeed a work of mercy.

Laudato Si' points us the right direction.

Only together, all together, we will be successful.

"If everyone does something, then we can do a lot."

Giuseppe Puglisi (1993)

Thank you very much.

Looking forward to meeting you in Rome

Yours sincerely

Tullio Pagano



Personal profile

Engineer, education between the European Union and the United States, Tullio Pagano (tullio.pagano@gmail.com) has got broad experience in energy field, especially regarding renewables and energy efficiency technologies.

Manager at an Italian public utility, he also works as an expert of the European Commission for the evaluation of RTD projects under Programme Horizon 2020.

He is consulted by the Pontifical Council of Justice and Peace on issues concerning sustainable and integral development.

Married, four children.

Essential references

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